COTTON

JANUARY, 1939

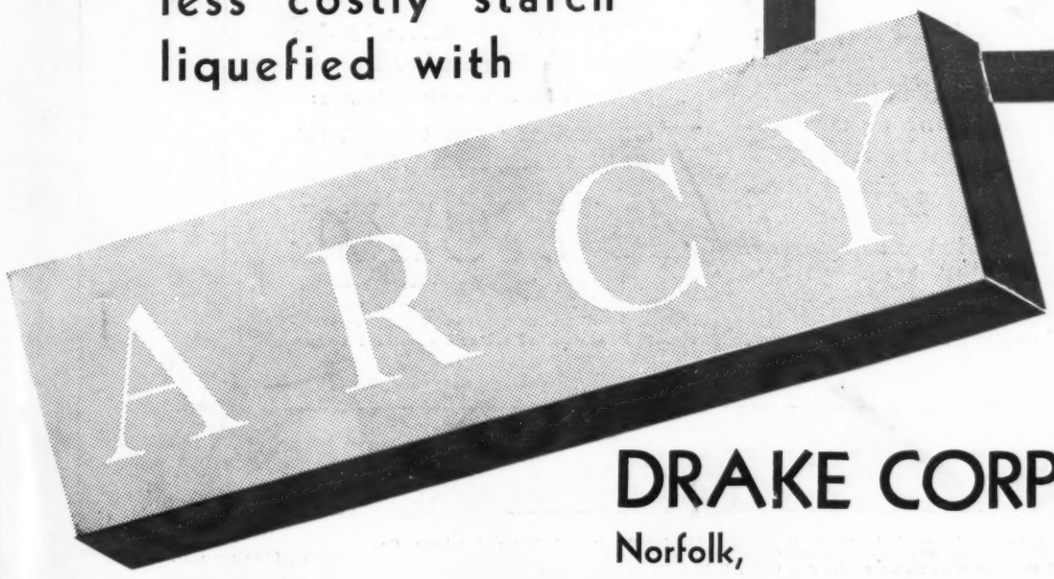
SERVING THE

Textile Industries

What USERS Say!

One of the many reasons given by mill operating executives for using less costly starch liquefied with

"It is not because of the dollar or so we save in the cost per kettle of size that we use Arcy Liquefied 'less costly' starch, but because of the superior results we get from its use."



DRAKE CORPORATION

Norfolk, Virginia

A DYE BEAM THAT NEVER SAYS "DIE"...

TAKE a look at this Monel dye beam. It is one of eight in use at the plant of the Minneola Mfg. Co., Gibsonville, N. C. Is it *new?* No...even though it looks new, it has seen several years' service and is good for many more. Made by Morton Machine Works of Columbus, Ga., it has a perforated barrel of 1/8" thick Monel. The tie rods and nuts are also Monel. Other plants using Monel dye beams report over 15 years of service...with dye beams still good for further use.

Write for further information. Address:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N. Y.

INCO MONEL **MONEL**

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.

COTTON is published monthly by W. R. C. Smith Publishing Company, Dalton and Atlanta, Ga.
Subscription Rates. United States and Possessions, $4.00 for one year; $2.00 for three years; Canada, $1.50 per year; Foreign Countries, $2.00 per year.
Entered as second-class matter at the Post Office, Dalton, Ga., under the Act of March 3, 1879.

TS1550
C8

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5892 D

A Modern Family
With Modern Utensils

Works Wonders in Short Hours and With Small Effort

The X Family of
High Speed Looms

Are Modern Utensils Needed in Every Cotton and Rayon Mill

The Farmer No Longer Plows with Horses Modern Dinners Are Not Cooked in the Old Open Fireplace ❖ Your Clerks Do Not Write Letters with Quill Pens

Why Not Let
Members of the X Family
Take Up the Work

in Your Mill ❖ They Will Do It Efficiently Will Increase Your Profits ❖ Will Keep You in the Forefront in the Industrial Race

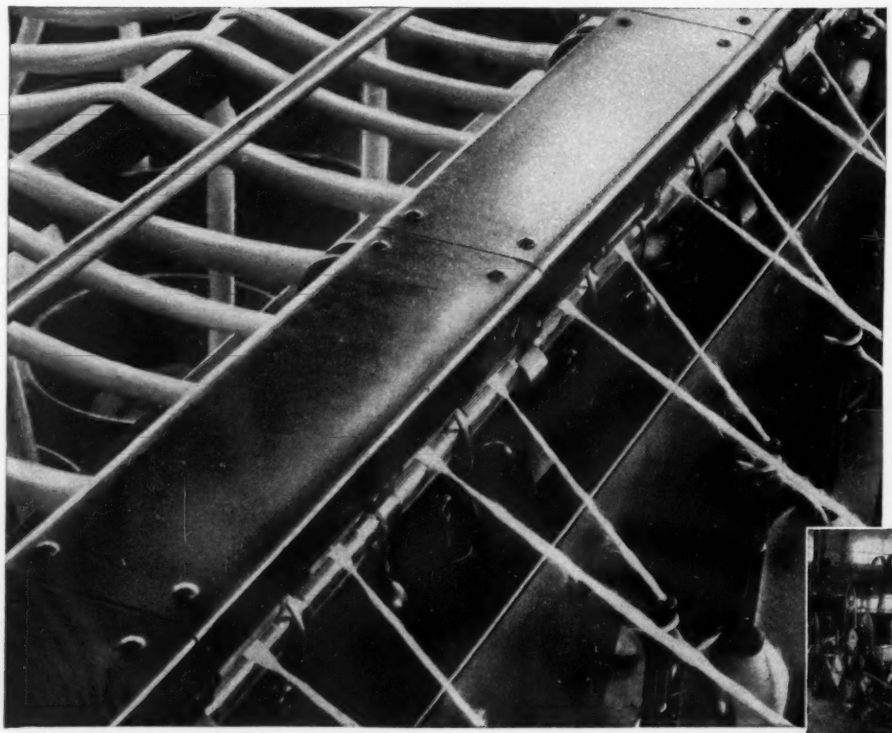
X Models Weave 20% More Cloth

DRAPER CORPORATION

Atlanta Georgia Hopedale Massachusetts Spartanburg S C

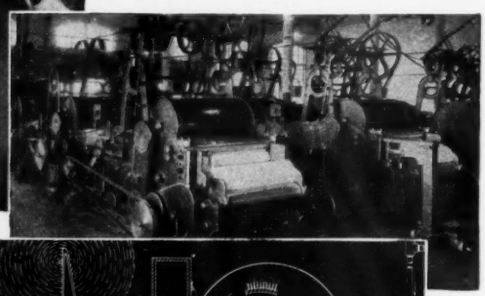
LESS STATIC

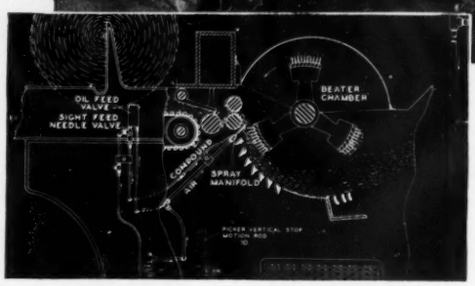
WHEN RUNNING CUT RAYON!



INCREASED PRODUCTION *throughout the mill, reduced fly and dust, cleaner machines, walls and ceilings, healthier working conditions, are certain Texspray results.*

TEXSPRAY COMPOUND *is applied to the stock as it enters the beater chamber of the picker. Here only clean stock is sprayed, as all leaves, hulls, trash have been removed. Study this diagram for success in cotton conditioning.*





YOU WILL EXPERIENCE a very great reduction of the static nuisance, immediately your stock is conditioned by the Texspray System.

Even when running cut staple rayon, straight or mixed, the static problem is largely solved with Texspray. The Texspray System of Cotton Conditioning is available only to mills located in cotton manufacturing centers of the United States. If you are so located, a Texaco engineer will be glad to call upon you and explain the System, entirely without obligation.

The Texas Company, 135 East 42nd Street, N. Y. C.

TEXACO
REG. U.S. PAT. OFF.

Texaco Dealers invite you to tune in The Texaco Star Theatre—a full hour of all-star entertainment—Every Wednesday Night—Columbia Network—9:00 E.S.T., 8:00 C.S.T., 7:00 M.S.T., 6:00 P.S.T.

TEXACO *Texspray*

SYSTEM OF COTTON CONDITIONING

Unmistakable Identification

KAUMAGRAPH DRY TRANSFERS

In obtaining valuable mink, unmistakable marks guide the trapper. In marketing textile products, adequate identification protects the maker, the buyer and the consumer. Kaumagraph Dry Transfers, Embossed Seals, Lithographed Labels and Packings provide the means for attractive, safe, sure and economical identification. May we help you work out your Identification Program?

Identification Headquarters

KAUMAGRAPH *Company*

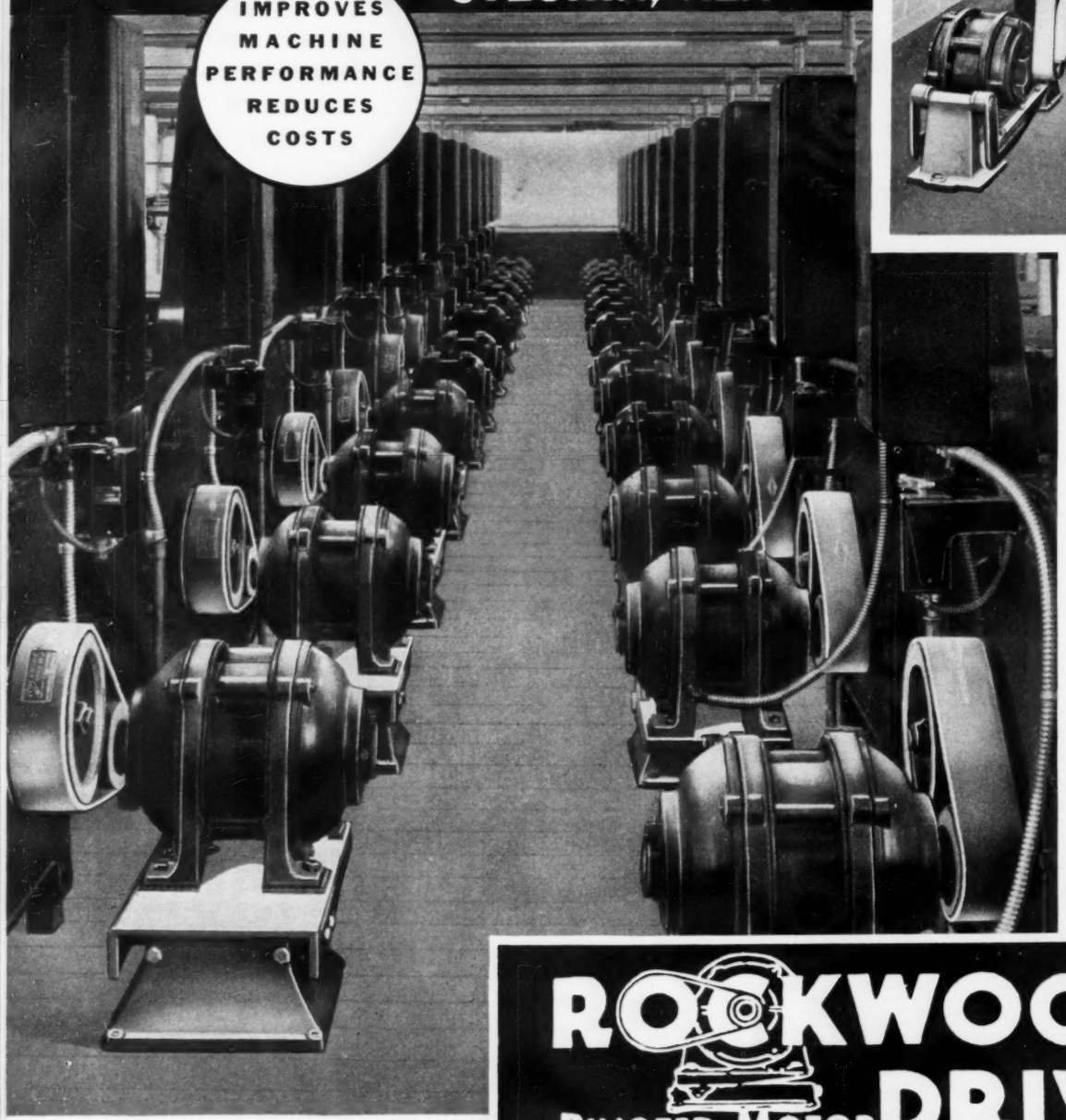
200 Varick Street, New York City

Plants: New York City . . . Paris, Ontario . . . Manchester, England
Representatives in Principal Textile Centers of the World

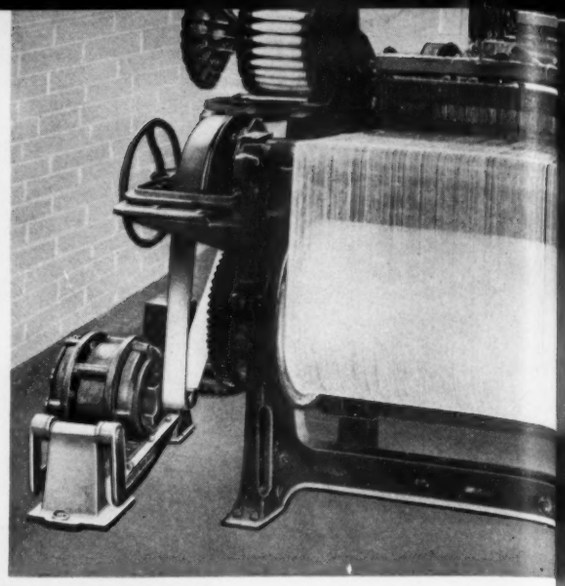
TYPICAL ROCKWOOD DRIVE PERFORMANCE

BUCK CREEK COTTON MILLS SILURIA, ALA

IMPROVES MACHINE PERFORMANCE REDUCES COSTS



Some of the seventy-two Rockwood pedestal-type spinning frame drives. Cylinder shaft speeds are more uniform with Rockwood Drives than with any other belt drive.



ROCKWOOD LOOM DRIVES *are on eighteen of the looms at the Buck Creek Cotton Mills. As with their spinning frames, Rockwood Loom Drives also improve quality and reduce costs - "picks" are kept uniform day in and day out.*

ROCKWOOD SPEED CHANGE PULLEYS

For quick and easy speed change Rockwood offers this interchangeable rim pulley where the rim bolts to a separate hub. Speed changes are made by taking off the old rim and bolting on an inexpensive new rim of the desired diameter. Used and well liked in a great many cotton mills.

ROCKWOOD PIVOTED MOTOR DRIVE

Buck Creek Mill Improves Quality and Reduces Costs.

When this well known Alabama manufacturer of sheetings and flannels modernized their plant recently to improve quality and reduce costs they used Rockwood pivoted-motor Drives extensively. They did an effective job too, including air conditioning.

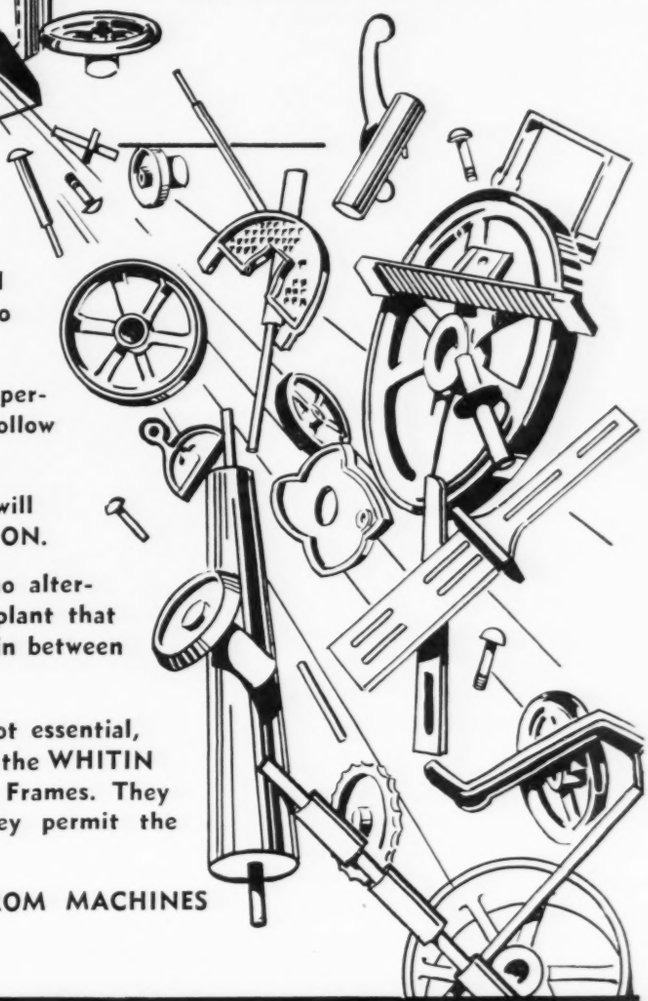
Seventy-two Rockwood pedestal type Spinning Frame Drives were used - eighteen Rockwood Loom Drives and six Rockwood Vertical-type Drives on the slubbers.

Rockwood drives automatically keep the belts tight and therefore the belt speeds are uniform - so driven machine speeds and *production* are *uniform.* Belt stretch is taken up and proper belt tension is maintained by using part of the weight of the motor and part electric torque reaction or kick-back to meet changing loads automatically.

In addition to better spinning, weaving and slubbing, BELT LIFE IS INCREASED, DRIVE MAINTENANCE IS DECREASED AND POWER IS SAVED. Thus Rockwood pivoted-motor bases are proved necessary for best performance and lowest operating costs with textile mill machinery. That is why they are included in nearly all important modernizing jobs by leading cotton mills and engineers. LET US TELL YOU WHAT ROCKWOOD CAN DO *TO IMPROVE YOUR PRODUCTION AND REDUCE YOUR RUNNING COSTS.*

ROCKWOOD MANUFACTURING CO. INDIANAPOLIS

SQUEEZED BETWEEN the UPPER and NETHER MILLSTONES!



A SITUATION in which many plants find themselves today because they are not geared to meet conditions.

Machinery that is antiquated, or that has been superseded by better, higher productive units, MUST follow one of two paths:

It will go the way of MODERNIZATION — Or it will tumble down the ruthless road to LIQUIDATION.

In the battle of Production for Profit there is no alternative. The advantage is all on the side of the plant that can use the lever of Low Cost to widen the margin between Cost of Product and Selling Price.

If replacement of machines by newer types is not essential, then an economical solution is by the application of the WHITIN better drafting systems to Roving and Spinning Frames. They give higher production and better quality. They permit the abandonment of non-essential processes.

THEY THROW OFF THE BELTS FOREVER FROM MACHINES THAT ARE NO LONGER NEEDED.

WHITIN MACHINE WORKS
WHITINSVILLE, MASSACHUSETTS, U. S. A.
CHARLOTTE, N. C. ATLANTA, GA.

another true case history from the Allis-Chalmers files that proves **"IT PAYS TO BUY THE EQUIPMENT THAT PAYS FOR ITSELF!"**

HOW A DRIVE REVOLUTIONIZED AN INDUSTRY!

Read the Amazing Story of How the Texrope Drive Cut Average Drive Maintenance Costs on Spinning Frames to $1.05 per Year . . . Saved Thousands of Dollars in the Textile Industry! Find out How Allis-Chalmers Equipment . . . the Equipment that Pays for Itself . . . Can Save You Money!

DRIVING SPINNING FRAMES in a large southern textile mill are these Allis-Chalmers "Quick-Clean" Motors and Texrope Drives.

● They brought a tough job to Allis-Chalmers . . . those engineers from a large southern textile mill. They had trouble . . . plenty of it. They had drives that slipped or jerked, snapping fragile yarn on spinning frames . . . spattering oil on processed goods.

Production costs were running rampant. Spinning frames had to be stopped while repairs were made . . . while broken threads were re-tied. Oil-damaged goods had to be sold for a fraction of their actual cost . . . far below standard market values.

They came to Allis-Chalmers. And no wonder! For they knew that Allis-Chalmers, with an engineering background extending over half a century, could help them. Allis-Chalmers did help them . . . and in doing so, revolutionized an entire industry!

For out of this engineering problem came the Texrope Drive. And because the Texrope Drive did not slip . . . did not jerk . . . did not break the yarn on the frames, production costs were cut to an absolute minimum throughout the textile industry. Actually, drive maintenance costs on spinning frames were reduced to the sensationally low average of $1.05 per year!

From the Textile Industry to All Industry!

All this happened in the 1920's. And today throughout all industry . . . all over the world . . . the Texrope Drive is setting amazing records in cutting costs, in beating power waste. Texrope Drives have paid for themselves, hundreds of times over, wherever they are installed!

This true case history is not an unusual occurrence at Allis-Chalmers. It's another engineering solution to the constant problems that confront industry . . . another noteworthy addition to the Allis-Chalmers line of equipment that pays for itself.

Get the complete details on the way Allis-Chalmers can put 90 years of engineering experience to work for you. Get the facts. In the District Office near you, there's an Allis-Chalmers engineer who can show you how to make your plant a bigger money-maker . . . with the equipment that pays for itself!

973

Vari-Pitch Speed Changers • Texrope V-Belts • Duro-Brace Texsteel Sheaves • Vari-Pitch Sheaves • Standard Cast Iron Sheaves • Adjustable Pitch Diameter Texsteel Sheaves • 2-3-4 Combination Sheaves • Straitline Automatic Motor Bases • Oil Field Drilling Rigs

Belts by Goodrich

TEXROPE DIVISION

ALLIS-CHALMERS

MILWAUKEE · WISCONSIN

A SERVICE that finds its chief purpose the ***profitable*** turnover of merchandise . . . ***that*** is "Constructive Factoring" . . . of which we will be only too glad to tell you more.

MILL FACTORS CORPORATION

354 Fourth Avenue, New York City

DU PONT ANNOUNCES

ZELAN

TRADE MARK

DURABLE WATER REPELLENT

A remarkable new finish that remains repellent after many washings and dry cleanings

AN ENTIRELY new type, ZELAN offers many advantages over ordinary water repellents—opens up new uses, broadens old ones.

Chemically, ZELAN is radically new. Applied only in the finishing process, ZELAN, a definite chemical compound, combines with fibers to form a durable repellent complex. It does not merely coat them as do the older types of repellents. Thus, ZELAN becomes an integral part of the fiber, remaining through many washings and dry cleanings.

This durability of ZELAN makes practical for the first time a water repellent, spot and stain resistant finish for many garments and furnishings. Because it repels coffee and tea, carbonated beverages and other water solutions, ZELAN will be specified for a wide range of consumer merchandise. It may be applied to cotton, linen, rayon and pure silk. The processing of wool is now being developed. Raincoats, golf jackets, shower curtains, clothing, canvas goods, outdoor furniture, uniforms, gloves, hosiery, tablecloths and a host of other articles will be made of fabrics treated with ZELAN.

ZELAN improves the appearance, drape and handle of fabrics—gives them a softer, smoother finish that cleans and washes more easily than untreated fabrics. This effect also survives washing and dry cleaning.

A standard ZELAN label will identify fabrics that are properly treated. Manufacturers having proper equipment for applying ZELAN will be authorized to use the ZELAN label after fabrics have been tested and approved. The Better Fabrics Testing Bureau, laboratory of the National Retail Dry Goods Association, will test samples for water repellency, moisture absorption and durability. Samples taken from continued production will be tested to assure maintenance of high standards.

The cutting-up trade and piece goods buyers are asking for fabrics treated with ZELAN Durable Water Repellent. For complete technical details and methods of application, write one of our branch offices.

DU PONT
REG. U.S. PAT. OFF.

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Organic Chemicals Dept. . . . Fine Chemicals Division . . . Wilmington, Del.

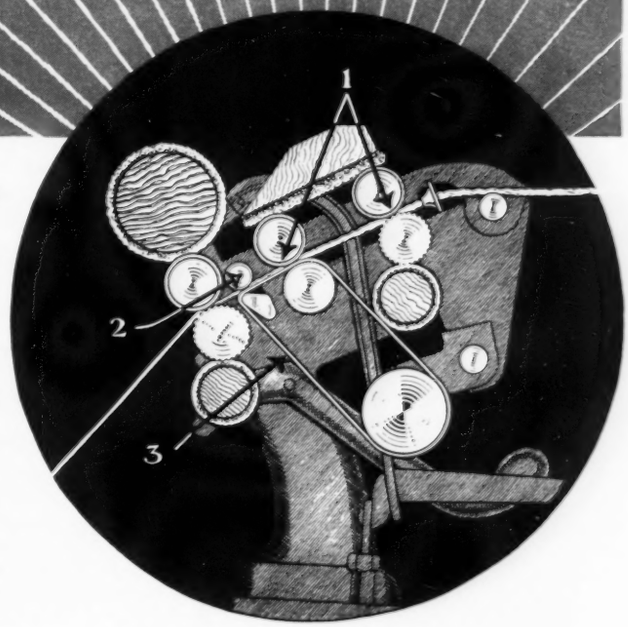
SALES OFFICES:

Boston, Mass., Charlotte, N. C., Chicago, Ill., New York, N. Y., Philadelphia, Pa., Providence, R. I., and San Francisco, Calif.

DU PONT ALSO manufactures "Aridex"* water repellent—a superior repellent of the wax emulsion type—particularly satisfactory where extreme durability of the water repellent is not required.

*Reg. U. S. Pat. Off.

FROM 4's TO 140...
BETTER YARNS
with Savings up to 34%



THIS *Saving* HAS BEEN MADE

ON OVER 5,750,000 SPINDLES equipped with Saco-Lowell Better Draft Units. Not only do these units make stronger, more even, and better-looking yarn, but do it with less ends down and less waste.

A CONCRETE EXAMPLE is a large South Carolina mill with 31,440 spindles of Saco-Lowell Better Draft Spinning attaining the production formerly requiring 40,608 conventional spindles, and in addition 78 roving frames are no longer needed.

MANY SIMILAR RESULTS in Europe, South America, and other countries are convincing evidence that, of all the long draft available today, more than any other does the Saco-Lowell Better Draft meet the demands of mills insistent on economy in operation, effectiveness in drafting, simplicity in construction, and adaptability to all the commercial cottons used today, regardless of character or origin.

SACO-LOWELL BETTER DRAFT SYSTEM is equally efficient on synthetic staple fibres and mixtures of this material with cotton.

OUR ENGINEERS and technicians will gladly cooperate with mills interested in improving their operating conditions, or assuring their profits through a well planned modernization program.

1. A DEFINITE BREAK DRAFT assured by two positively weighted rolls with highly effective fibre-holding and fibre-drafting surfaces.

2. A CONTROL ROLLER feeds the shorter fibres with regularity, and allows the longer strength-giving ones to be drawn from the strand without breakage.

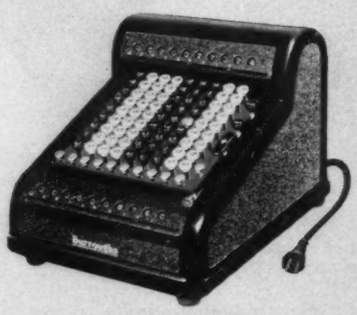
3. A CARRIER APRON whose single function is transporting the strand of unlocked fibres. It has nothing to do with the drafting, and its performance is unaffected by age or atmospheric conditions.

SACO-LOWELL SHOPS 60 Batterymarch Street, Boston, Mass.

Charlotte, N. C. Greenville, S. C. Atlanta, Ga.

Burroughs Labor Computing and Accounting Machine

Burroughs Low-Cost Payroll Accounting Machine



Burroughs Electric Adding Calculator

Burroughs

covers the entire range of

WAGE AND HOUR RECORDS and STATISTICS

along with all payroll records and labor distribution

Burroughs machines provide these five important records, including wage and hour statistics, in a fraction of the time required by ordinary methods:

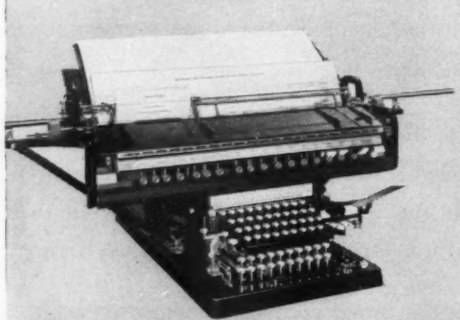
1. **Individual Employee's Hour and Earnings Record.**
2. **Individual Employee's Pay Statement or Receipt.**
3. **Individual Employee's Pay Check or Envelope.**
4. **Departmental or Group Payroll Summary Sheet.**
5. **Departmental or Group Payroll Check Register.**

If desired, *all five* can be prepared on a single machine *in one operation,* under any one of several plans.

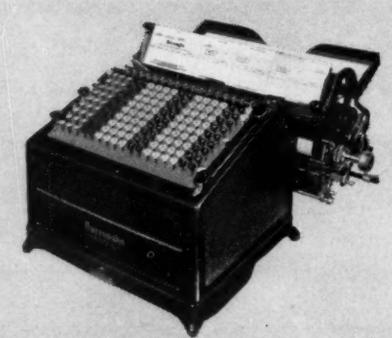
To determine the particular machine and plan that will fit your requirements at the lowest cost, call the local Burroughs representative. Or, if more convenient, write to—

BURROUGHS ADDING MACHINE COMPANY
6168 Second Boulevard, Detroit, Michigan

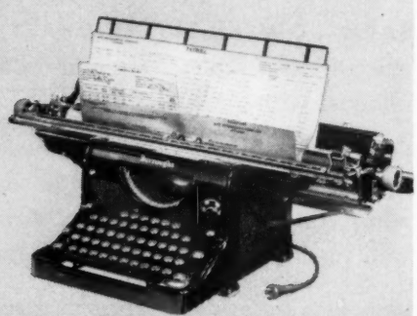
Illustrated are six different types of Burroughs machines for payroll and labor accounting. These machines are offered in many styles and sizes to meet the requirements of any business, large or small.



Burroughs Labor Accounting and Statistical Machine



Burroughs Payroll Accounting Machine



Burroughs Payroll and Form Writing Machine

THIS IS NO. 13 OF A SERIES ON

GETTING THE MOST FROM WINDING

Information about winding designed to show improvements in winding equipment and new ideas in the winding operation

PREVENTION OF OIL LEAKS ON NO. 90 WINDER

Reports from service calls show that many mills are asking for suggestions on how to prevent oil leakage on their No. 90 Winders. The information below should make it possible for any mill to eliminate this trouble, provided that the machines are in good operating condition.

Check the Oil Return Hole

Many mills are not aware of the return oil hole (A) in the gainer frame under the drive shaft. This hole allows oil escaping along the drive shaft to return into the case. However, when the level of the oil in the case is too high, the hole acts as an overflow; it is therefore important to keep the oil supply down to the proper level.

Sometimes, even with the oil at the proper level, waste collected around the oil grooves on the hub of the driving pulley will act as a wick to draw oil out of the gainer case through the drive shaft bushing. This waste should be removed and the oil return hole cleaned out.

The same trouble may exist at the hub on the spindle on the outside of the frame. The spindle should be partially withdrawn and waste removed so, in case of leakage along the spindle, the oil will be slung off, returning to the frame through the oil hole (B). With the spindle withdrawn, the oil hole should be cleaned.

At the End of the Drive Shaft

If the drive shaft can be moved in and out, it indicates wear on the ends of the bushing contacting the driving pulley and the collar. This causes a pumping action, the bushing must be replaced.

Next, remove the driving pulley and try to move the drive shaft up and down. If oil oozes out between shaft and bushing, then the hole in the bushing is worn. A tight driving belt will cramp the shaft and cause the bushing to wear.

Leaks May Also Occur

at the oil tubes (C) between the cases. The oil tube connections are inclined to settle and must be tightened once a year. These tubes distribute oil through the cases, and naturally the machine must be level to maintain correct amount of oil in each case.

The machine should be equipped with regular oil guards. If they are removed, oil spray from the gears will cause leaks at the traverse bar bearings, especially on the side nearest the gears. Spray will also cause oil to leak under the covers.

To prevent loose oil from leaking through, the nut holding the Traverse Bar Support Bracket at "D" should be tightened about once a year.

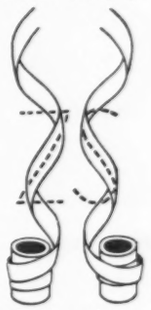
Proper Lubrication

The oil is considered at the proper level when the top of the boss (E) is just exposed over the surface of the oil. Another place to check the proper level is halfway between top and bottom of the tubes (C) connecting the cases.

Once every three years all the oil should be removed from the cases by means of a suction pump and thrown away.

The grade of oil recommended should have a Saybolt viscosity of 120 to 130 seconds at 100° F. Standard Oil Company's Gargoyle Velocite C or equivalent should be satisfactory. Oils with a higher Saybolt viscosity are too heavy, causing the winder to heat up and also increasing the horsepower required.

TWIST DISTURBANCE (No. 50 Winder)



When removing yarn over the end of any supply package, there is always the question of whether twist is being added or taken out. There is a very simple test which demonstrates what happens.

The illustration shows two identically wound packages of narrow ribbon or tape. Their positions have been reversed, that is, the end of the tube which is down in one case is up in the other (changing the direction of the wind). You will note that the one on the left, unwinding clockwise, has added "Z" twist by removing the ribbon over the end of the package. The one on the right, unwinding counter-clockwise, has added "S" twist. You can demonstrate further by winding narrow strips of paper or ribbon around your finger.

This test proves that twist is added or taken out at the winder depending on the way the supply package is put on the supply spindle. When one end of the package is up, more twist is added to S twist yarn; or taken out of Z twist yarn. When the other end of the package is up, more twist is added to yarn with Z twist; or taken out of S twist yarn. When yarn is taken over the end of the package, twist is disturbed one turn for every circumference of the supply package.

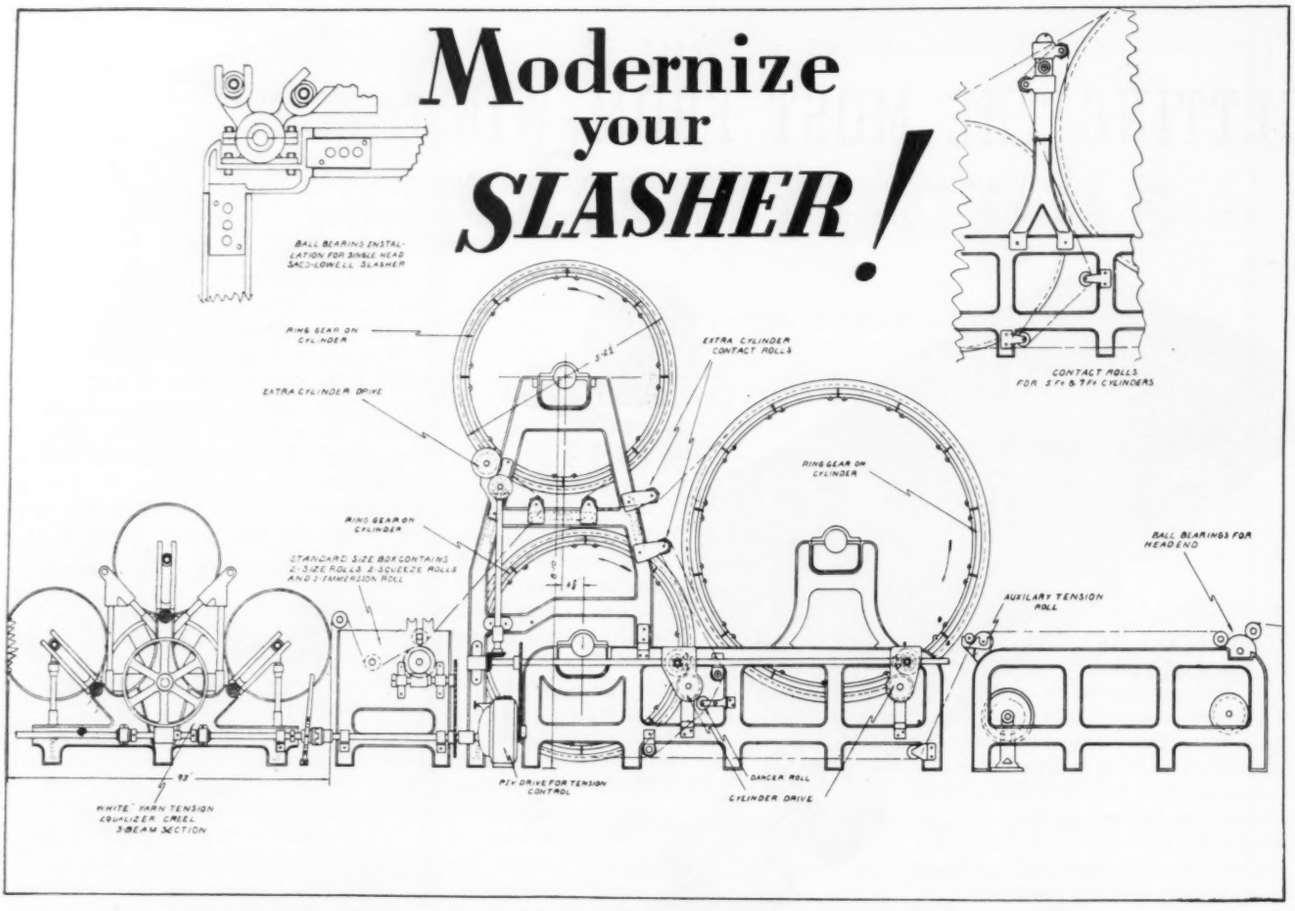
Operators having trouble with high-twist yarn kinking on some winding spindles will find they can get uniform results by making sure the proper end of supply package is up in all cases so twist is ***taken out*** instead of added.

"THERE'S A UNIVERSAL WINDER FOR EVERY TEXTILE NEED"

UNIVERSAL WINDING COMPANY

PROVIDENCE BOSTON PHILADELPHIA UTICA CHARLOTTE ATLANTA

Modernize your *SLASHER!*


BALL BEARING INSTALLATION FOR SINGLE HEAD SACO-LOWELL SLASHER
RING GEAR ON CYLINDER
EXTRA CYLINDER CONTACT ROLLS
CONTACT ROLLS FOR 5 FT. & 7 FT. CYLINDERS
EXTRA CYLINDER DRIVE
RING GEAR ON CYLINDER
RING GEAR ON CYLINDER
STANDARD SIZE BOX CONTAINS 2 SIZE ROLLS 2 SQUEEZE ROLLS AND 1 IMMERSION ROLL
BALL BEARINGS FOR HEADEND
AUXILARY TENSION ROLL
92"
"WHITE" YARN TENSION EQUALIZER CREEL 3 BEAM SECTION
P.I.V. DRIVE FOR TENSION CONTROL
DANCER ROLL
CYLINDER DRIVE

...*With* WEST POINT *Products*

EXTRA CYLINDER ASSEMBLY to increase drying surface and drying speeds.

POSITIVE GEAR DRIVE to turn the drying cylinders without straining the yarn.

CONTACT ROLLS to obtain the maximum wrap of the yarn around the drying cylinders.

BALL BEARING MOUNTINGS for cylinder and delivery roll to decrease power requirements and provide smooth operation.

TENSION CONTROLS

"WHITE" YARN TENSION EQUALIZING CREEL, a positively driven creel that delivers yarn free from stretch and strain.

POSITIVE, INFINITELY VARIABLE DRIVE to regulate the tension throughout the slashing process.

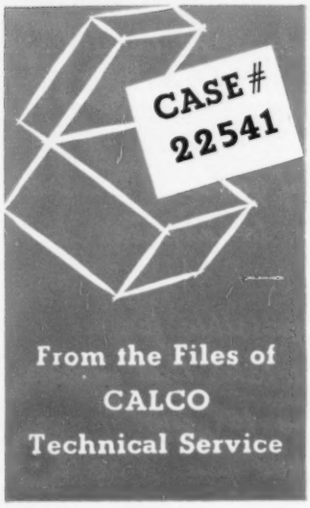
AUXILIARY TENSION ROLL to obtain correct separation of the ends at leese rods.

Inquiries Solicited

WEST POINT FOUNDRY & MACHINE CO.

(Batson-Cook Company, Owners)

WEST POINT, GEORGIA



A PERFECT MATCH . . . on Unions

The problem that one mill put up to us required matching as economically as possible 12 shades on cotton and wool unions for boys' suits, mackinaws, ladies' cloaks and ski clothes. Our Technical Service Staff was not asked to produce any specific saving, but from 8% to 10% resulted.

A great deal of the research we have done on union colors is shown by a new shade card just published, which contains 25 pages of swatches, each with five different threads showing results obtained. We will gladly send it to any dyer or chemist writing to us on the stationery of his firm.

This book represents one of the ways in which Calco is constantly trying to help in practical ways any user of dyes. Our Technical Service Staff is ready to work with you in applying new ideas in practical and economical ways, as well as straightening out the difficulties that sometimes arise in normal production. If you would like a member of our staff to call simply write or wire our main office or nearest branch. There is no cost or obligation.

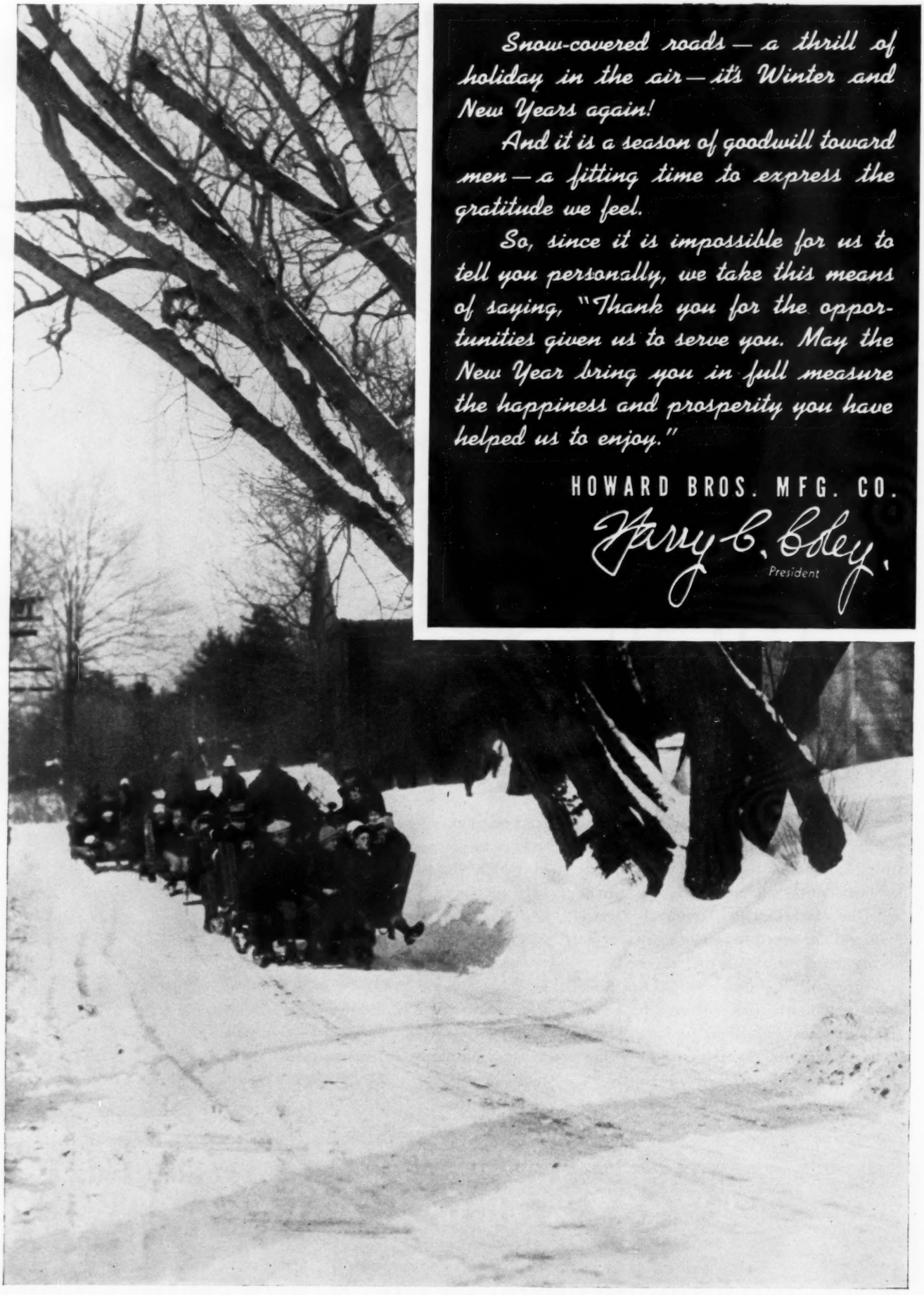
CALCO DYES ARE BETTER BUYS

THE CALCO CHEMICAL COMPANY, INC. · BOUND BROOK, NEW JERSEY

Calco

A DIVISION OF AMERICAN CYANAMID CO.

BOSTON · PHILADELPHIA · PROVIDENCE · NEW YORK · CHARLOTTE · CHICAGO · PATERSON



Snow-covered roads — a thrill of holiday in the air — it's Winter and New Years again!

And it is a season of goodwill toward men — a fitting time to express the gratitude we feel.

So, since it is impossible for us to tell you personally, we take this means of saying, "Thank you for the opportunities given us to serve you. May the New Year bring you in full measure the happiness and prosperity you have helped us to enjoy."

HOWARD BROS. MFG. CO.

Harry C. Boley,

President

BLIND SAILING...

leads to nowhere!

To prosper today you must chart a sound, scientific course in all phases of business. You must know your exact position NOW and you must anticipate and prepare for future eventualities.

The George S. May Company has piloted over 2,324 enterprises, large and small, through dangerous channels and pointed the way to better business and greater earnings. This background of experience will prove invaluable to you in solving every business problem regardless of its nature . . . management, production, distribution, sales and advertising . . . or any operation which influences profit.

No matter what problems confront you, it will pay you to investigate May Methods. Address the nearest office listed below. A consultation will not obligate you and may lead to substantial benefits.

ENGINEERS

GEORGE S. MAY COMPANY

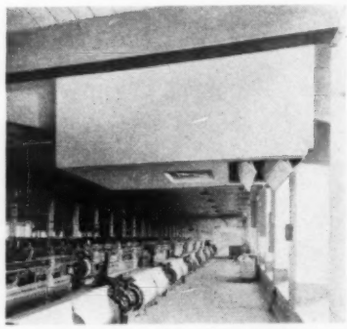
CHICAGO	SEATTLE	ATLANTA	NEW YORK
2600 North Shore Ave.	710 Second Avenue	134 Peachtree St.	122 East 42nd St.

CANADA: George S. May, Ltd., 320 Bay St., Toronto

OFFICES IN 15 OTHER PRINCIPAL CITIES

PARKS Automatic AIRCHANGER

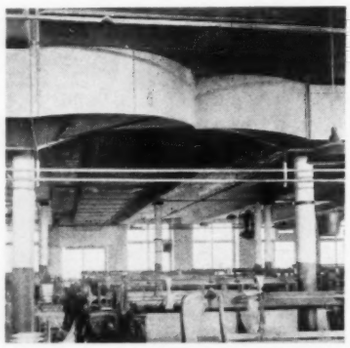
How it works . . . and what makes it different



1

AIR ENTERS

Fan in this mixing chamber draws in air . . . and propels it forward. Air comes from outside (opening not shown) . . . or from room (opening at bottom) or at times from both.



2

. . . IS PUSHED

Pushed forward through ducts at ceiling, the amount of outside air . . . or its mixture with inside air . . . is regulated and automatically balanced with evaporation.

3

IS DISCHARGED

Discharged through a series of duct outlets, air circulates throughout the room. Free moisture from humidifiers evaporates, heat is removed . . . and marked uniformity, particularly of humidity, results.

4

. . . ESCAPES

The "measured service" air . . . and with it much of the heat . . . escapes through a series of automatic exhaust shutters. With a slight pressure in the room, leakage is outward, increasing uniformity.

What Makes an Airchanger?

Fans? Ventilation? Important, yes. But these do not make an Airchanger. Other systems blow—but are not Airchangers.

The Airchanger, with its automatic humidity regulation, keeps Humidity Constant. Otherwise it isn't an Airchanger.

Other systems can't control air change by the Humidity Regulator. So they fail at Airchanger's most vital spot.

The Parks patented Humidity Psychrostat begins to restrict air change immediately humidity falls off. Knows when to prod the humidifiers or hold 'em back; or when to increase the air change. Knows how to keep them in balance.

Knows how to keep humidifiers running, and get the most out of them for evaporative cooling.

HUMIDITY STAYS PUT.

Only the Parks Automatic Airchanger has automatic humidity regulation of this sort. Without it, it isn't an Airchanger.

PARKS *Certified* **CLIMATE**

PARKS-CRAMER CO • FITCHBURG, MASS. • CHARLOTTE, N. C.

SOROMINES

are the ideal softeners for giving rayon fabrics the smooth, subtle drape that appeals to discriminating customers.

GDC

GENERAL DYESTUFF CORPORATION

435 HUDSON STREET, NEW YORK, N. Y.

Available in hp ratings from 3 to 15 hp

"They're Cleaning Fine!"

We hear from users that the G-E screenless open spinning-frame motors are "cleaning fine." This is evidence that these motors are operating successfully in lint-laden atmospheres, and consequently with less worry to mill operators over shutdowns or loss of efficiency because of the lint-clogging of motors. On these motors, specially shaped fans at both ends of the rotor exert a powerful force to expel any lint that may enter. Air passages are smooth—no baffles to interfere. Every practical step has been taken to assure long, effective motor operation. To get further information on these motors, inquire of the General Electric office nearest you, or write General Electric, Schenectady, N. Y.

New Mercury Switch Assures Full Bobbins

Because this switch stops the motion of the spinning frame at the correct time for doffing full bobbins, and because the normal coast of the frame to the rest position allows the switch lever to return itself to the reset position, this new switch saves doffing time and assures uniformly full bobbins.

It is especially suitable for the stop motions in spinning. It is operated by a latch on the ring rail, and when the rail reaches full-bobbin position, the latch raises the lever of the switch, shutting down the spinning frame. Only slight pressure is necessary for positive making or breaking of the electrical contact.

Durability—All parts of the mercury limit switch are enclosed, avoiding fire hazard from sparking. Some idea of the trouble-free quality of this switch can be had from the fact that on test a mercury switch worked 100,000,000 times.

General Electric, Dept. 6B-201
Schenectady, N. Y.

Please send me Publication GEA-1557B.

Name.....

Company.....

Street.....

City and State..... 011-445

General Electric, Dept. 6B-201
Schenectady, N. Y.

Please have a representative call to discuss this switch with us.

Name.....

Company.....

Street.....

City and State..... 011-445

GENERAL ELECTRIC

LOOK INSIDE

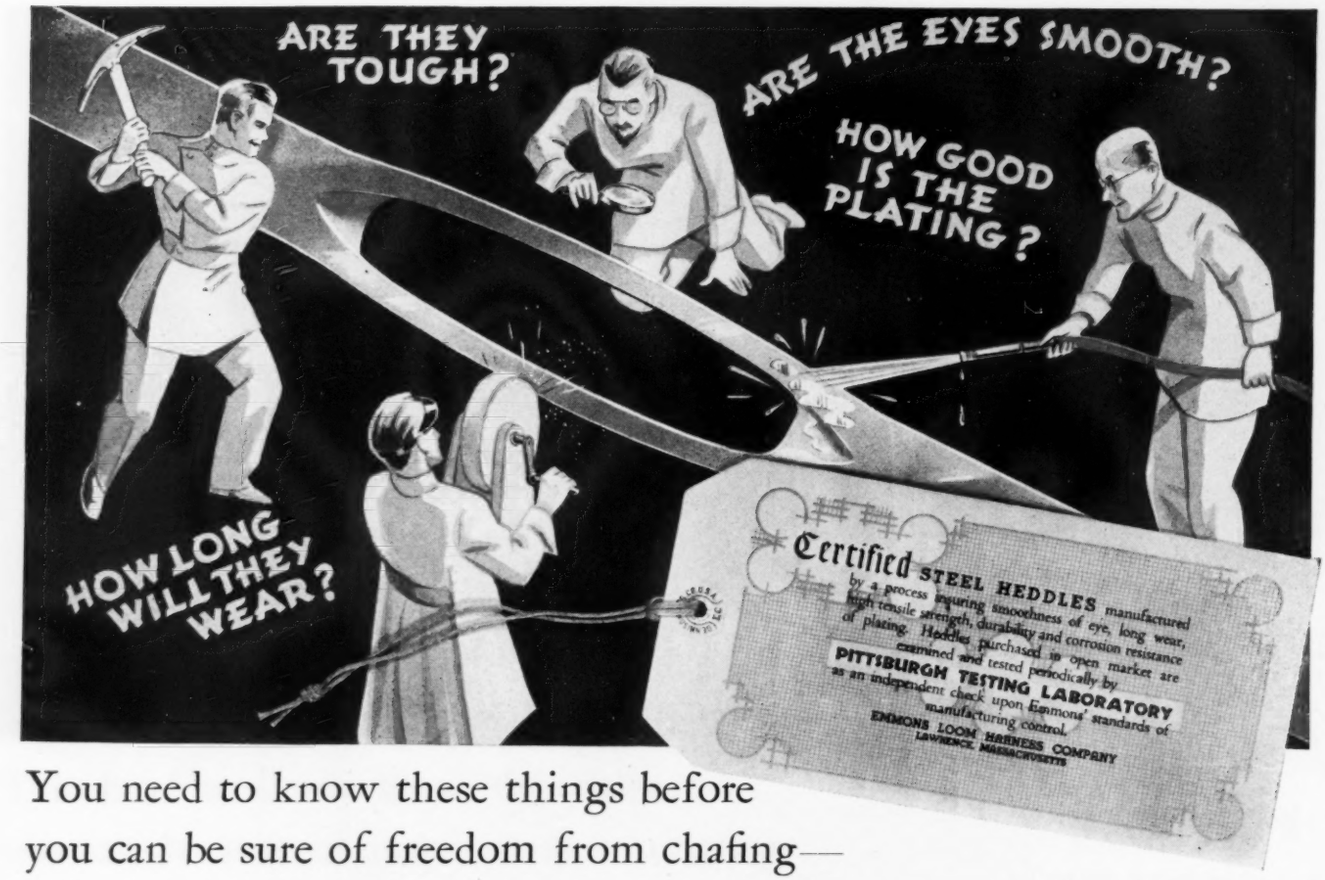
FOR THE WORTH OF REPUBLIC BELTING AND HOSE

ORDER REPUBLIC PRODUCTS FROM YOUR DISTRIBUTOR

■ What we know as rubber belting and hose are, of course, combinations of various reenforcing materials with rubber compounds. Since these other elements are necessary in the mechanical application of rubber—too much importance cannot be placed on the way they are combined. . . . . Extensive laboratory and experimental facilities are constantly utilized in developing specifications and better means of uniting the component parts of Republic Belting and Hose. You have only to examine the inner design of a product to detect Republic's advancement in built-in quality—you will find duck construction of belting designed to eliminate internal chafing . . . strong and resilient cord construction in pneumatic hose for resistance to unusual shock and abuse . . . tenacious rubber compounds for wear and tear. These and similar refinements in the structure of Republic Products are evidence of experience and skill in the manufacture of Mechanical Rubber Goods. . . . . The next time your plant requires belting or hose replacements, look into the merits of a Republic Brand. Discover for yourself the features of design and quality which mean additional service. Profit from what you find. Specify Republic. Republic Rubber Division of Lee Rubber and Tire Corporation, Youngstown, Ohio . .

REPUBLIC RUBBER

HOSE · BELTING · PACKING · MOLDED PRODUCTS


ARE THEY TOUGH?
ARE THE EYES SMOOTH?
HOW GOOD IS THE PLATING?
HOW LONG WILL THEY WEAR?
Certified STEEL HEDDLES manufactured by a process insuring smoothness of eye, long wear, high tensile strength, durability and corrosion resistance of plating. Heddles purchased in open market are examined and tested periodically by
PITTSBURGH TESTING LABORATORY
as an independent check upon Emmons' standards of manufacturing control.
EMMONS LOOM HARNESS COMPANY
LAWRENCE, MASSACHUSETTS

You need to know these things before you can be sure of freedom from chafing—better weaving—uniform warp tension—fewer warp breaks

. . . . Your Answer is the "CERTIFIED" Tag!

You know beforehand what you'll get when you buy "Certified" Steel Heddles—because their quality is *tested* by the Pittsburgh Testing Laboratory and double-checked by our own inspection.

The P.T.L. tests are an independent check on Emmons standards of manufacturing quality—your assurance of smooth heddle eyes—long wear—high tensile strength—durability and corrosion resistance of plating . . . *all* necessary for better weaving on your looms.

Tests already published have shown how "Certified" Steel Heddles were pulled until they broke at the eye, so that *you* could know their high tensile strength. They were bent 100,000 times—*without breaking!* Cadmium plated heddles were sprayed with a ruinous salt spray for 168 hours—*and they didn't rust!* And their eyes were sawed with threads—to prove how smooth they are.

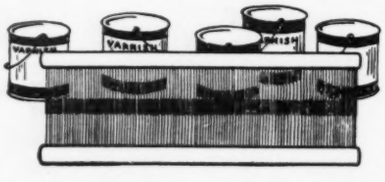
This is *our* way of protecting *your* purchases. *Know* what you buy. *Specify* the heddles with the "Certified" tag! Quick delivery. Emmons Loom Harness Company, Lawrence, Mass., Charlotte Division, Charlotte, N. C.

Emmons

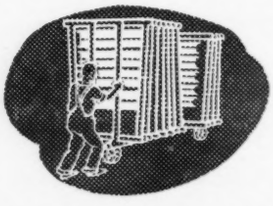
"CERTIFIED" STEEL HEDDLES

EMMONS CHAFELESS CORD COTTON HARNESS

Emmons picks the best and longest staple cotton for greater strength, longer life.



5 coats of specially prepared varnish make Chafeless Cord humidity proof.



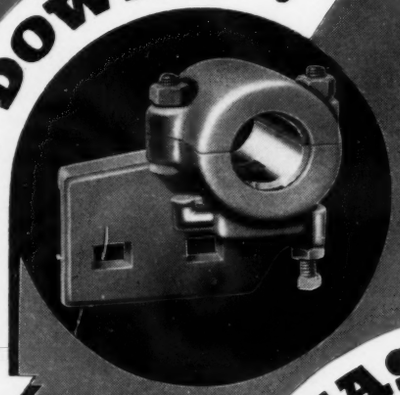
A 48-hour baking process makes the harness super-smooth. Less fly. Better cloth.

EMMONS LOOM HARNESS COMPANY — LAWRENCE, MASS. — CHARLOTTE, N. C.

You're naturally "POINTED for Profit"

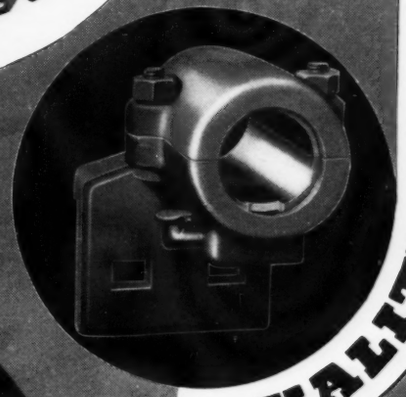
...when DODGE Loom Drives and DODGE Bearings are at work in your mill...

COSTS DOWN...



INCREASED PRODUCTION...

QUALITY UP...



IN Textile Mills where Dodge Loom Drives and Dodge Capillary Oiling Loom Bearings are installed, operating costs are being reduced and the quality of cloth improved . . . The Dodge Loom Drive will smooth out loom operation and reduce breakage of parts . . . It meets peak requirements because the flywheel provides a source of reserve power . . . Its expanding ring clutch can be instantly engaged or disengaged . . belt slippage and power-robbing parts are eliminated . . . Dodge Bearings embody the capillary oiling principle which is positive and unfailing, and greatly reduce maintenance cost . . . Let us send you Dodge Bulletin A-236 which describes these units.

DODGE MANUFACTURING CORPORATION
Mishawaka, Indiana, U.S.A.

THE Right Drive FOR EVERY JOB

Copyright 1939, Dodge Manufacturing Corp.
Mishawaka, Indiana

DODGE
MISHAWAKA

THERE IS ADDED VALUE IN THE NAME DODGE

"BETTER THAN DAYLIGHT"

Means

BETTER SEEING
BETTER WORKMEN
BETTER WORK

Seeing is the vital link between good operators and good work. Seeing is precisely what manufacturers obtain with Cooper Hewitts, engineered to fit the job. They make the mere physical act of seeing easier. Eye-strain and resulting fatigue is reduced. More uniform high-quality production is assured.

It will pay you to give your workers the best light obtainable. Hundreds of mill owners and operators prefer Cooper Hewitts for this reason. They get "better than daylight" illumination every hour of the day. The light blends well with daylight, makes good seeing a partner in perfect production.

Our representatives know the economics as well as the engineering of modern textile plant lighting. Write for complete information. General Electric Vapor Lamp Company, 853 Adams Street, Hoboken, New Jersey.

GENERAL ELECTRIC VAPOR LAMP COMPANY

924C

COOPER HEWITT MERCURY VAPOR LIGHT

"WE *Watch* COMPARATIVE MAINTENANCE COSTS...

...*and use* GULF'S *higher quality* LUBRICANTS to keep them down" SAY LEADING MILL MANAGERS

"We DISTINGUISH CAREFULLY between LUBRICANTS costs and *LUBRICATION* costs," says this mill executive. "We bring comparative maintenance costs into the picture when we figure our *final* lubrication costs. If maintenance is low while production holds at a steady pace — or increases — we know our *real* lubrication costs are low, even though we've paid a few cents more per gallon for quality lubricants."

That far-sighted viewpoint is helping hundreds of mill men, from Maine to Texas, secure the economies management demands today in manufacturing costs. And it logically leads them to the use of Gulf's higher quality oils and greases. Mill managers find that when these better grades of lubricants are applied as recommended by an experienced Gulf engineer, production flows more smoothly, less time is lost for adjustments and repairs, and maintenance costs are lower. After Gulf quality lubricants have been placed in service, it is not uncommon for mill managers to report savings in maintenances alone amounting to more than the total monthly bill for lubricants!

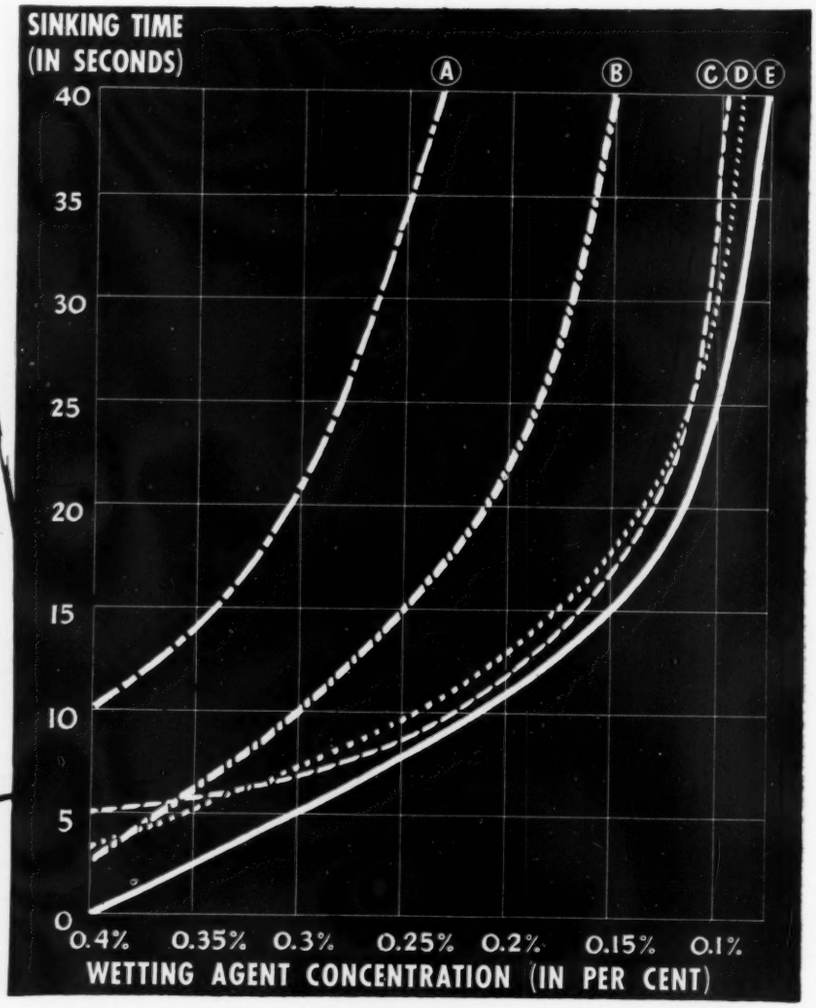
So we suggest that you *watch comparative maintenance costs* from month to month in your plant, and ask a Gulf engineer to assist you in finding ways to effect savings through improved lubrication. He will work tactfully with your operating men — and they can benefit from his broad experience in the lubrication of machinery similar to yours. Gulf Oil Corporation — Gulf Refining Company, Gulf Building, Pittsburgh, Pennsylvania.

GULF INDUSTRIAL LUBRICATION

WETTING-OUT COMPARISONS

Method of
CARL Z. DRAVES

A An Alkyl Aromatic Sulphonate
B A Soluble Pine Oil
C A Sulphated Ester
D A Sulphated Alcohol
E WETSIT, conc.



INSTANT WETTING-OUT

● Wetsit saves time in processing, reduces the cost of detergents and assures an improved and more uniform finished product.

The instantaneous wetting properties of Wetsit aid in such processes as scouring, bleaching, fulling, dyeing, yarn conditioning, sizing, sanforizing, rinsing, etc.

Wetsit is a new synthetic compound which reduces surface tension in water solution—giving complete penetration. Wetsit also has emulsifying, dispersing and detergent properties. Wetsit is not affected by the lime and magnesium salts of hard water—it is equally efficient and gives abundant foam in neutral, acid or alkaline conditions. If used with soap Wetsit prevents the formation of lime curds. When dissolved in water it does not hydrolize to give free alkali.

Wetsit displays great surface activity in concentrations as low as 0.1% which assures rapid wetting, complete penetration and level or uniform results.

FREE—Write today for samples.

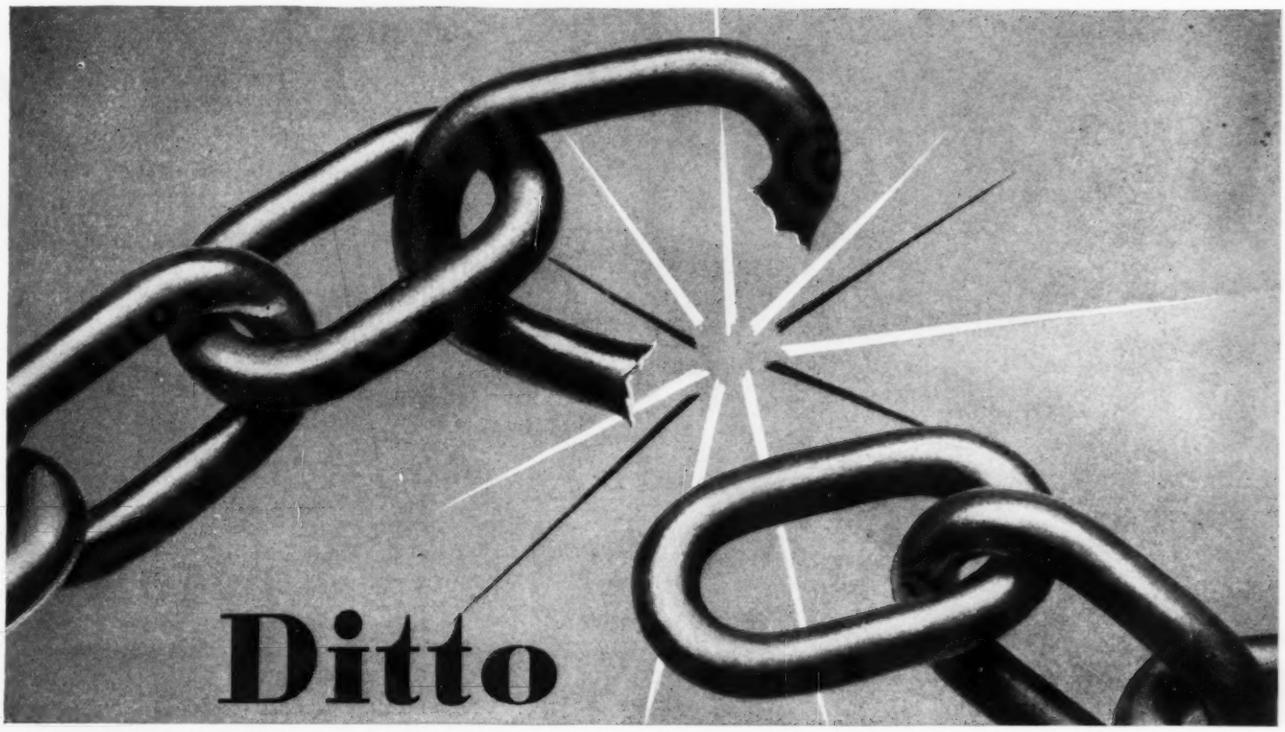
Reduced surface tension — complete penetration

with WETSIT

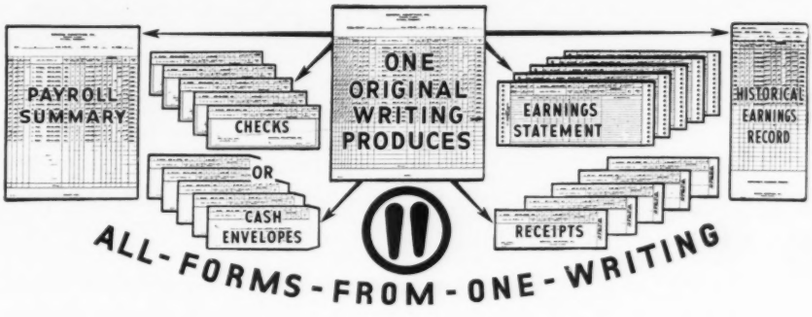
WOLF BRAND PRODUCTS

JACQUES WOLF & CO.
Chemicals PASSAIC, N. J.

WAREHOUSES: Providence, R. I., Philadelphia, Pa., Utica, N. Y., Chicago, Ill., Greenville, S. C., Chattanooga, Tenn.



BREAK THAT SHACKLE *of* PAYROLL EXPENSE!



Profit isn't easily earned these days. All the more reason for ***earning*** by ***saving*** with the Ditto Payroll Method. Probably your biggest outgo is payroll. And payroll accountancy is itself non-profitable! Therefore let Ditto account for every penny paid to every worker, ***without*** costly machines, ***without*** posting and rewriting, ***without*** expensive mistakes! At the same time let Ditto provide payroll records that satisfy State and Federal authorities!

Know What Users Say!

Burlington Mills: "Used in larger plants, now installing in smaller ones. Would have to add to personnel under Social Security Act were it not for Ditto" . . . ***Bossong Hosiery Mills:*** "Saves many hours, but, best of all, makes error impossible. Also, duplicates our forms, and is so useful we couldn't do without". . . . ***Ashe Hosiery Mills:*** "Ditto payroll method is one of the best things we ever did—eliminates error, saves time; couldn't do without" . . . ***McLaurin Hosiery Mills:*** "It is the complete payroll system, with minimum clerical work" . . . and so on by the score.

Get This Revealing Book

The fast, errorless and photographically accurate Ditto-One-Writing Payroll Method earns by saving. More mills are constantly adopting the Ditto method. It reproduces direct from time card, or timekeeper's or payroll clerk's original sheets. Alert Mill Paymasters, Managers, Owners, are reading "The Ditto Payroll System," the book that shows how to save mightily. Get Yours!

SEND FOR THIS BOOK AND FOR A COMPLETE SET OF PAYROLL FORMS IN ACTUAL USE IN PROMINENT TEXTILE MILLS

Ditto *Inc.*

2212 W. Harrison St., Chicago, Ills.

Gentlemen: At no obligation to me please send your detailed payroll study, "The Ditto Payroll System".

*My Name & Title*_____

Mill _____

*Town*_____ *State*_____

In a Year He'll Be Worn Out!

--but Machinery Can Be Kept "Young" with More Efficient Repair Parts.

Production programs for 1939 bring many problems, not the least of which is the question of machinery maintenance costs and the amount of wear and tear it will show when 1940 rolls around.

No matter how new or modern the textile machine, it cannot operate with true efficiency or stand up under the wear and tear of high speed production when many of its parts wear quickly or fit imperfectly. Why not decide now to keep your machinery "young" with the aid of more efficient repair parts?

HENDERSON Textile Repair Parts are the result of careful study of modern textile equipment to ascertain the weakest points. They have that added strength at the weak spots that prevent quick wear and constant breakdown. Precision patterns are used to insure that every part fits perfectly, thereby saving much in vibration and friction. Good materials plus careful workmanship insure dependability and long life.

Let us quote prices on any part or any number of parts for any make of textile machinery.

HENDERSON FOUNDRY & MACHINE WORKS
HAMPTON, GEORGIA

FREE, BUT THEY TELL YOU A LOT!

The brochures pictured on this page are charged with money saving data for the mill man interested in cheaper and better automatic feeding and raw stock extracting and drying . . .

THE NEWEST DEVELOPMENT IN AUTOMATIC FEEDING AND DRYING. The booklet on the left describes an exclusive Hunter development, the New Rotary Feeder and Raw Stock Dryer consisting of a novel rotary automatic feed usually built as an integral part of the Hunter Duplex Raw Stock Dryer. The Rotary Feed, however, may be furnished as a separate unit to replace old feeders on your present dryers as well as with new machines. The Rotary Feeder is adaptable to any type or kind of raw stock and is available in any desired width or capacity. It may be used to feed any machine commonly requiring hand or automatic feeding of stock.

The booklet on the right describes the latest addition to better extraction . . . the HUNTER MODEL G HYDRAULICALLY CONTROLLED SQUEEZE ROLLS for cloth or stock. It describes the benefits of continuous operation and tells you in detail of its valuable and accurate hydraulic pressure control.

For complete brochures and details of just what these modern units are doing for outstanding mills, simply mail the coupon. They are yours for the asking and without obligation.

MAIL THE COUPON TODAY!

JAMES HUNTER MACHINE COMPANY

NORTH ADAMS MASSACHUSETTS

SOUTHERN AGENTS:
Carolina Specialty Co., Charlotte, N. C.

WESTERN REPRESENTATIVE:
E. G. Paules, 343 Bendix Bldg., 1206 Maple St., Los Angeles, Cal.

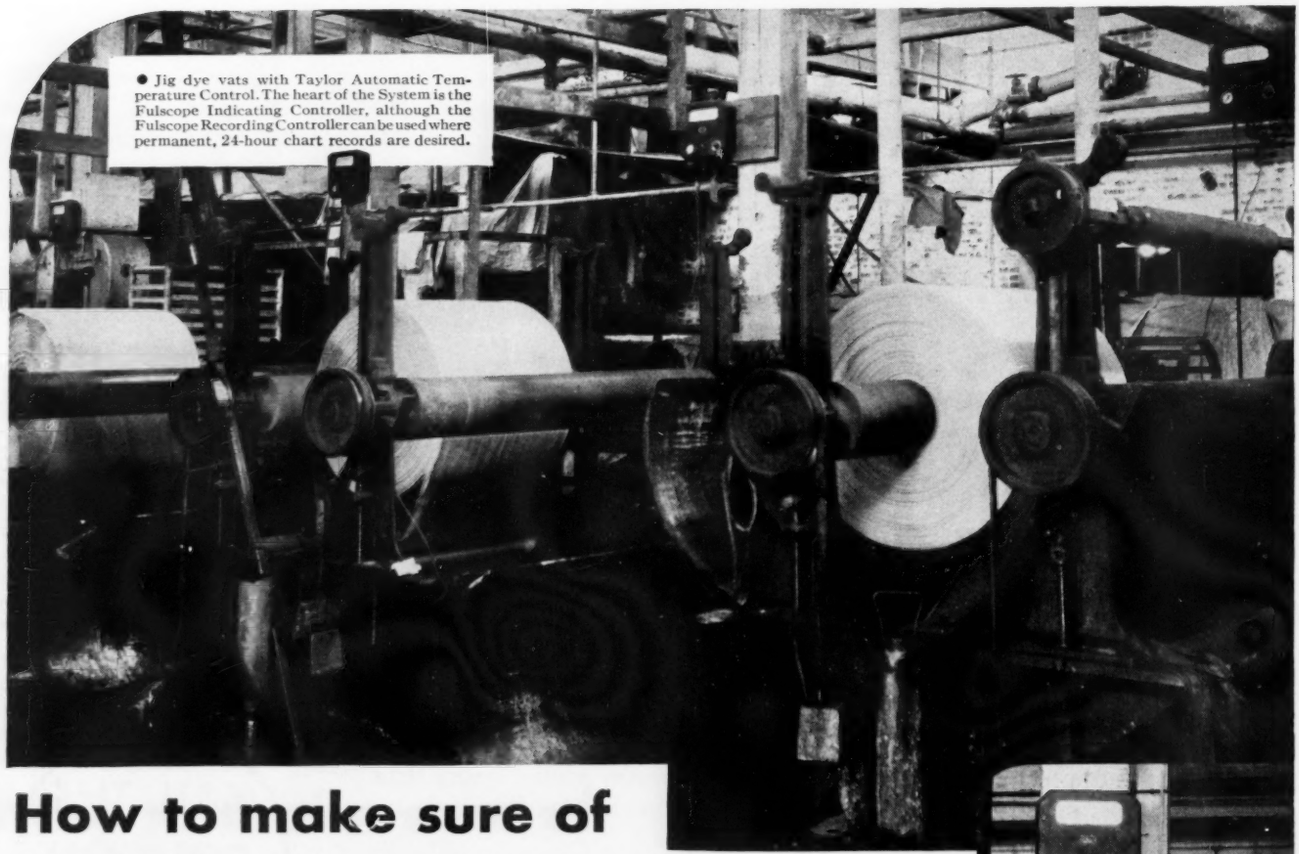
CANADIAN AGENTS: Colwool Accessories Limited
126 Wellington St., West, Toronto

Without obligation, please send Bulletin S R ☐ describing Model G Squeeze Rolls, and Bulletin R F describing Automatic Rotary Feeder and Raw Stock Dryer ☐

*Name*_____ *Title*_____

Company _____

*City*_____ *State*_____



● Jig dye vats with Taylor Automatic Temperature Control. The heart of the System is the Fulscope Indicating Controller, although the Fulscope Recording Controller can be used where permanent, 24-hour chart records are desired.

How to make sure of correct temperatures in JIG DYE VATS

Whether you need 140°F for vat colors, or a boil for direct colors, rely on Taylor Control to guard uniformity and quality of your cloth

THERE are many places in a finishing plant where it's bad business to guess about temperatures. The uniform quality of your cloth, reduction of processing costs, and maintenance of net profits all depend on accurate temperature control.

Taylor offers fully automatic control of temperatures. Many finishing plants have proved the efficiency of this system also in assuring the right water temperature for washing of the cloth after dyeing.

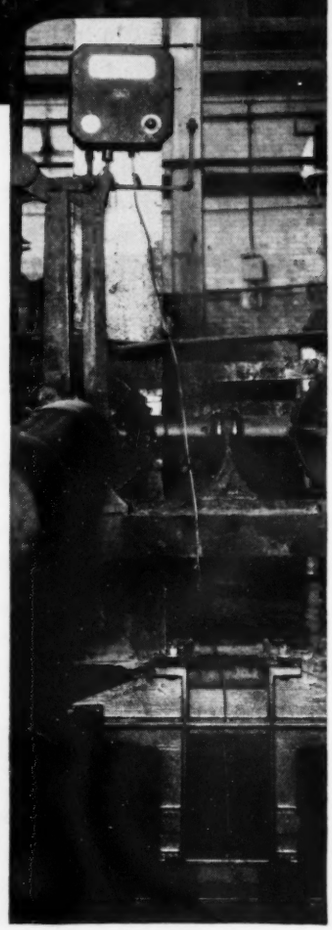
This modern Taylor Control is adaptable for use with either open or closed steam coils as the heating medium. Simple adjustment makes it possible to maintain correct temperature for vat direct or diazotized colors. All stainless chrome nickel iron bulb and tubing assures long life.

Perhaps you know Taylor best for its pioneering work in developing and perfecting Temperature Control for slashing. Know it now for ability to specify and install Control Systems for any part of finishing processes where temperature regulation is vital. If you have any problems on this score, ask a Taylor Representative how Taylor Textile Engineers can help you guard your cloth and save your money today. Taylor Instrument Companies, Rochester, N. Y. Plant also in Toronto, Canada. Manufacturers in Great Britain, Short & Mason, Ltd., London.

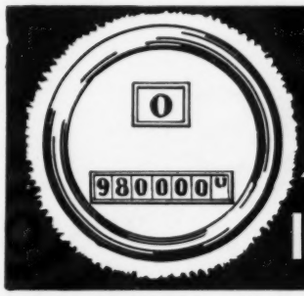
Taylor

Indicating Recording • Controlling

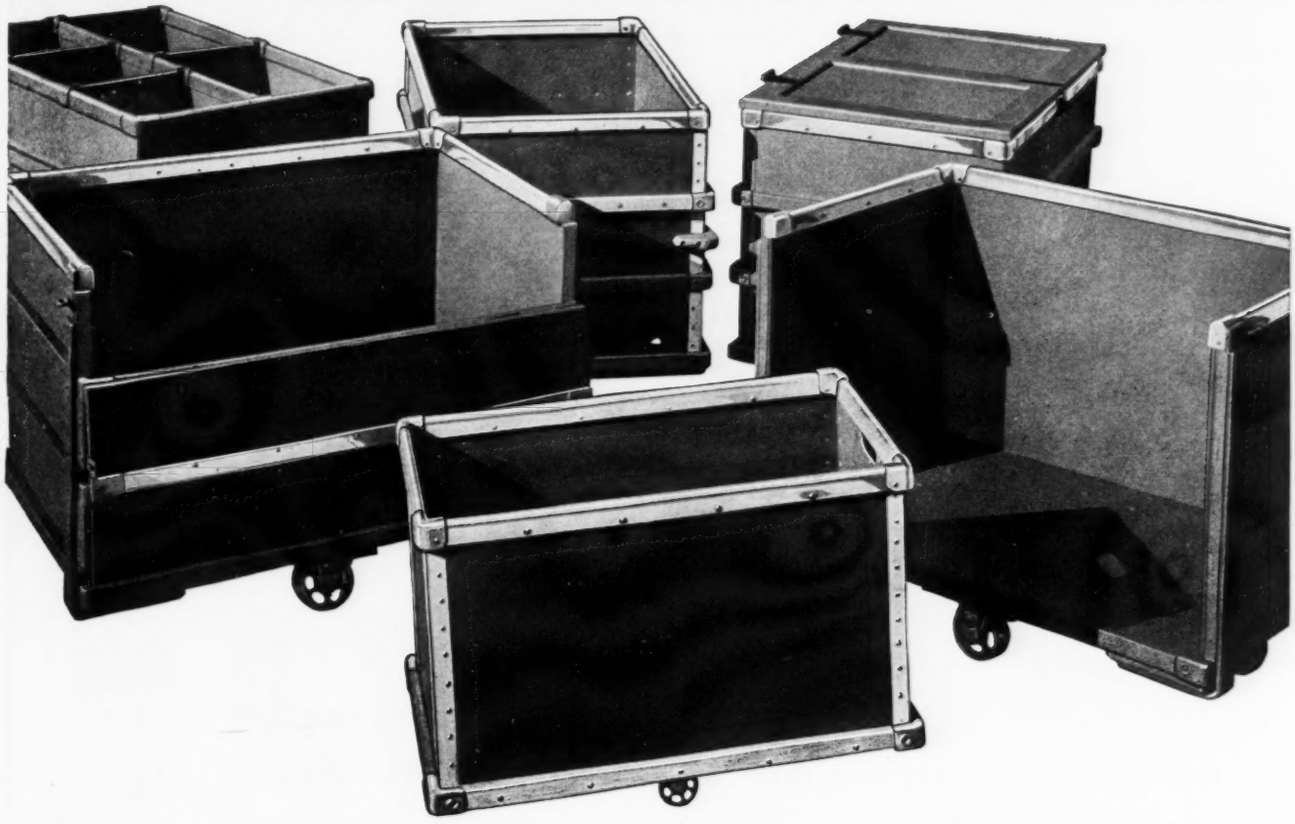
TEMPERATURE, PRESSURE, FLOW *and* LEVEL INSTRUMENTS



● View of Taylor tube system connecting temperature bulb in the dye vat liquid with the Fulscope Controller. With the correct length of tubing it is easy to place the Controller where it is most conveniently seen and reached. Send for more information on this and other Taylor Control Systems for Finishing Plants.



More Mileage
IN YOUR MATERIAL HANDLING



DIAMOND FIBRE TRUCKS

MORE "mileage" in the form of longer, trouble-free life is assured when your material handling is entrusted to DIAMOND FIBRE Trucks, because every one of them is of the same perfectly smooth, scuff-proof, splinter-proof construction. Remember too, that Diamond Fibre is lighter than aluminum and almost as strong as iron, is non-corrosive and grease and oil proof. All metal parts are heavily plated to resist corrosion.

A number of standard types are made that will meet practically any material handling problem. Special types and sizes to meet particular problems can be made to order without extra cost.

Use the coupon today and get your copy of the catalog showing the complete line of Diamond Fibre Hollow Ware. Address Continental Diamond Fibre Company, Department C., Newark, Delaware. In Canada the Diamond State Fibre Co. of Canada Ltd., Toronto.

DIAMOND FIBRE HOLLOW WARE
TRUCKS-BOXES-CANS-BASKETS-TRAYS

CONTINENTAL-DIAMOND FIBRE COMPANY
Dept. "C", Newark, Del.

☐ Please send catalog ☐ Have Salesman call

Name .....

Company .....

Address .....

City and State .....

NEW PICKERS
IN OLD FRAMES

At Half the Cost of

NEW PICKERS IN NEW FRAMES

About one-half the cost of building a new picker is in the frame—which never wears out.

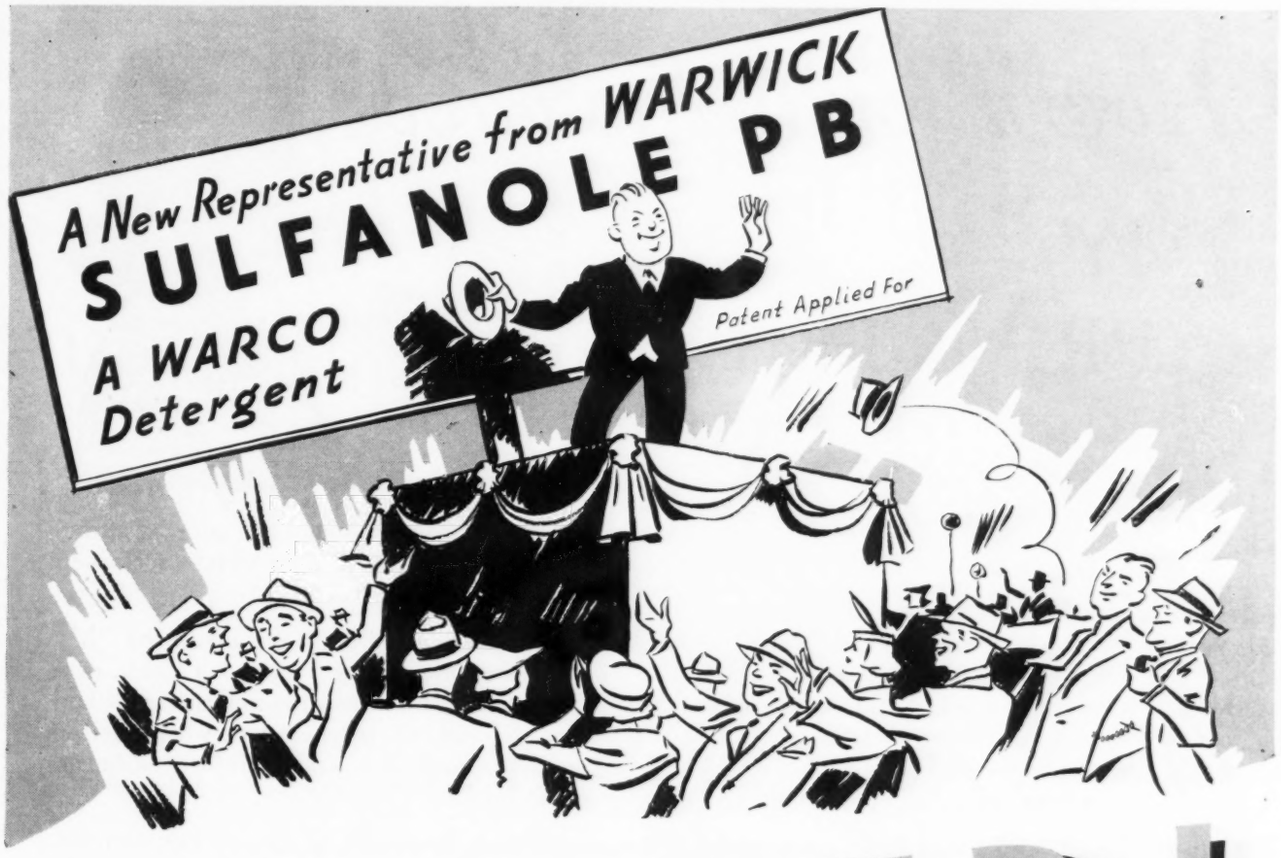
We can take your old pickers; strip off all the moving parts, and build new pickers including the **Aldrich Synchronizers** into these old frames.

If your old frames are broken or seriously damaged in any manner, we can replace them at nominal cost with other old frames which are sound and in good condition.

A picker rebuilt in this manner not only runs like a new picker; it is a new picker, and the **Aldrich Synchronized** single process picker has invariably turned out evener card sliver than any other picking system on every test which has ever been reported to us.

AldricH MachinE

Greenwood, **WorkS** South Carolina



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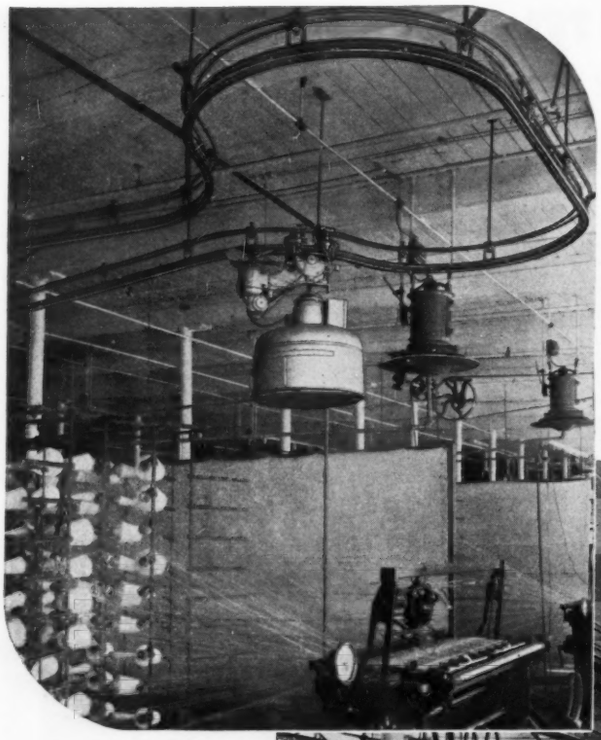

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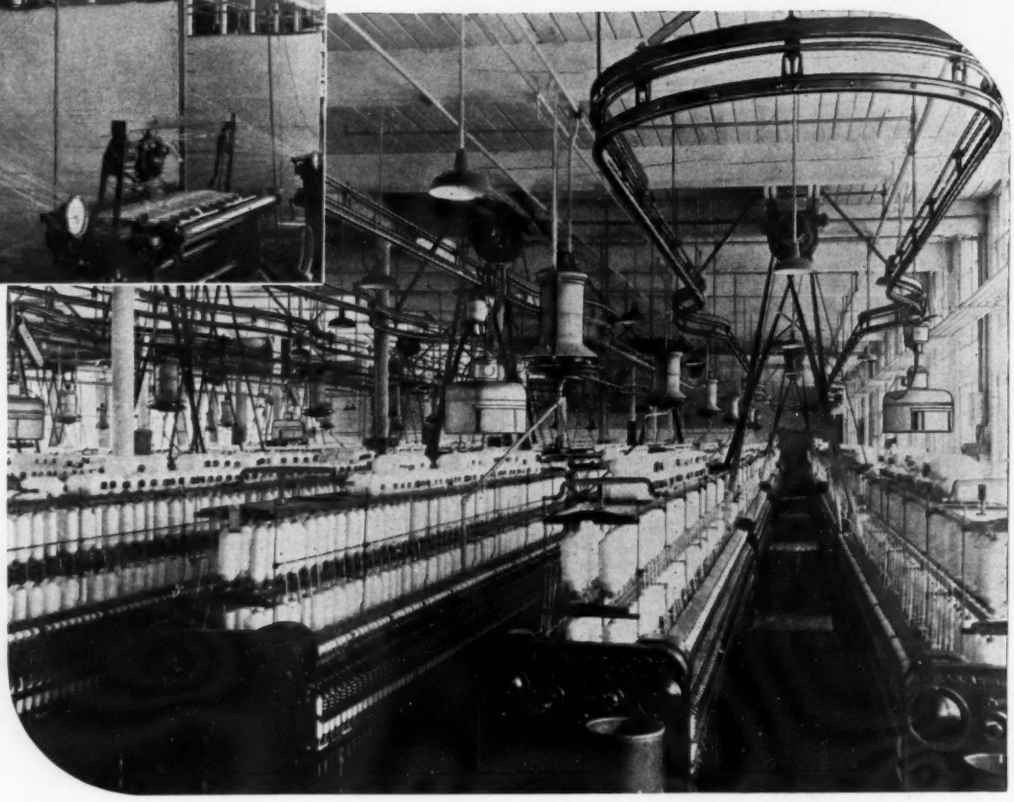

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VOL. 103 JANUARY, 1939 NO. 1

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My Private Secretary

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HUGH M. COMER

Avondale Mills,
Sylacauga, Ala.

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"We have read with interest 'Mismatching on Full-Fashioned' in August . . . advise us cost of 15 reprints."

B. DAUGHERTY.

Valley Forge Hosiery Mills,
Norristown, Pa.

"It is interesting to get visual evidence of the care with which publications are preserved by many . . . . . note the enclosed photograph taken in the office of the Kali Manufacturing Company of Philadelphia. This rack was designed by Miss Wench to hold current issues of magazines in which they are interested. Note the important position accorded to our old friend COTTON."

S. M. FERRER

Spearhead Service,
New York, N. Y.

Tut, tut, Mr. Ferrer, you can't surprise us with evidence of the care with which COTTON is preserved by many as we have seen too many mills and mill executives with bound volumes, and too many copies of COTTON on top of the superintendent's desk. We suspect a lurking motive to get a little extra publicity for Kali Manufacturing Company but anybody ambitious enough to take a photograph and send it on deserves recognition and all we ask is that you keep COTTON in this position all the time.

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"Inasmuch as we have complete volumes of COTTON from 1930 to date, indices for these years also would be a valuable addition to our library."

J. P. ELTING

Kendall Mills,
Paw Creek, N. C.

COTTON started issuing cross indexes with 1933, has copies for 1934, 1935 and 1936. 1937 supply exhausted.

LOOKING AHEAD

During 1939, S & R believes both readers and advertisers will be interested in coming events in COTTON, casting their shadow before. Special issues of merit during the year include the Annual Modernization and Maintenance Number in February, the Greenville Show Issue in April and the Modern Equipment and Process Number in October.

Looming large just now with its particular wide circulation and reader interest is the first of these—the February Modernization and Maintenance Number. Features will include a symposium of views from mill operating heads on the most important recent developments in modernization and some indications of what is still to be done; engineering developments showing modernization along technical lines; plant description of the outstanding mill addition of 1938 at Mathews Cotton Mills, Greenwood, S. C., including new power plant, mill village and laundry; further articles on up-to-date maintenance methods.

◆

Better Ginned Cotton

"You certainly have some wonderful reading matter in your paper, and I think the discussions of the various textile organizations are of remarkable interest to the men in the mill. I noticed an article where they were having a discussion on last year's crop of cotton and it is certainly true that the 1937 crop was mostly very unsatisfactory. As they discussed in this article, it showed a distinct weakness and lowered the breaking strength of the yarn.

"All these discussions confirm what other mill men have experienced. I certainly believe that the cotton growers can do a great deal to help the mill by better ginning and preparation of the cotton. It would also help to a very great extent in reducing the costs of clean cotton in the yarn. It looks too bad when some planters will take good care of the cultivation of their cotton all through the year and then ruin it by careless ginning. I certainly know that some of these planters do take great care in the preparation and ginning of their cotton, and it is always a pleasure to receive such cotton as it will reduce the comber waste at the comber and increase the quality and breaking strength of the yarn."

R. W. BOYS

Pres., Green River Mills, Inc.,
Tuxedo, N. C.

"I am attaching the correspondence and leaflets on improved ginning of cotton. . . . this should be much appreciated by all mill men and if possible put before farmers so they in turn could get after the ginners."

HARRY J. HORN

Walton Cotton Mill Co.,
Monroe, Ga.

(In an early issue COTTON will carry an article written by a mill superintendent in making a plea for better ginned cotton with a special emphasis on gin cut cotton.)

Waterproofing Textiles

"In the December 1934 issue of COTTON, Mr. Kelley, in an article on Waterproofing refers to a Government Formula for waterproofing textiles in which tallow soap, plus glue, is mixed with alum. We would very much appreciate learning the source of Mr. Kelley's information."

OSCAR EDELSTEIN

The Pond Lily Co.,
New Haven, Conn.

(This letter referred to Andrew Kelley of Burkart-Schier Chemical Co., Chattanooga, Tenn., the author of the article published four years ago. Incidentally this article was quite popular and the entire issue was exhausted shortly after printing.

◆

Prosperity Loses Sale

Competitors say it's a whopper, but believe it or not, E. H. Fairchild of Automatic Transportation Company tells us that a sure sale of a stacking machine was lost recently because the mill got caught in the rush of increased business and their warehouse stocks are so low they don't need the machine.

◆

Texans Get Their Man

"Out of the mass of applications we selected a man . . . we must compliment your magazine upon the fine results from our advertisement."

HUGH S. CLARKE.

Supt., Texas Textile Mills,
Dallas, Texas.

◆

Wants Finishing Article

"Kindly send us another copy of 'Some of the Problems in Print Cloth Bleaching & Finishing' by C. Norris Rabold, appearing in November 1938."

HERBERT ROSENBERG

American Finishing Co.,
Memphis, Tenn.

This is the fifth and final installment of a comprehensive series on the subject of textile printing by Mr. Rabold. Several copies of these articles still available.

S. R. O. should have been added to this welcome sign for the recent national meeting of the AATCC in Atlanta . . . . . .

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COTTON
SERVING THE
Textile Industries

January, 1939 Vol. 103 No. 1

"It Can Happen Here"

THE OLD-TIME economists, such as Adam Smith, were held up in a pretty ludicrous light by the apostles of the New Economic Era which seemed to have been ushered in, beginning about 1917. All the old rules were thrown away or changed, and ponderous articles were written by world authorities to show that everything was different now; that a new set of circumstances confronted us, and therefore an entirely new set of economic theories were needed. We are now beginning to see that this was mostly hooey; that the old economic theories were all right, but just needed a little polishing in spots to meet gradually changing conditions.

The ideas of the older economists about wealth and money were formed in a period when the multiplication of wealth was a relatively slow process, and national income, or creation of wealth, increased at such a slow pace that during one lifetime it did not alter appreciably. When one of those old-timers stated that there was only so much wealth to be divided, he was right according to his times, and all we need to do to make the statement right today is to modify it slightly by saying that at any given time there is only so much wealth in the country, and that if we want more, we must create it. Another condition which the older economists did not have to confront was the violent fluctuation in the money value of national wealth, which is so common today when quotations on the New York Stock Exchange have such a decided effect on our valuation of our real wealth. One or two hundred years ago, we not only did not have the machinery for creating wealth so rapidly, but we lacked the mechanism for inflating or deflating the value of our real wealth as rapidly as this can be done today.

IN SPITE OF all the outpourings of wisdom from our highest powered economists about the New Economic Era and the changes in the rules of the game, there is one fundamental economic truth that hasn't been changed, and won't be changed, and can't be changed, no matter what happens, and that is that you can't get more out of a thing than there is in it. Any attempt to do this leads inevitably to a false system of valuation which we conveniently term inflation. The price of a thing does not necessarily indicate its true value. Inflationary enthusiasm often sets up false values which are sometimes so perfectly ridiculous that it seems almost impossible for reasonably sensible people to accept these values as being even probable. In 1924, Florida swamp land, worth about 50c an acre, was solemnly being passed from one ownership to another at prices so utterly fantastic as to be almost inconceivable. Sensible business men, who had lived in Florida all their lives and who should have known that this was all moonshine, fell like a ton of bricks for the general hoopla, and convinced themselves, as well as outsiders, that in some obscure, indefinable way this worthless property had suddenly become tremendously valuable. In 1928 and 1929, this country reached the height of the folly of the New Economic Era. In a few swift plunges, the Florida boom and the national boom collapsed. The $2.00 swamp in Florida settled back from a $50,000.00 Development to a $2.00 swamp again; this being all it ever was, anyway. The $500.00 share of stock on the New York Exchange settled back to its original value, which may have been $100.00, and then skidded down below its true value. The fancy buildings that had been put up all over the country, with fabulous costs for labor and materials, nearly all went broke. Economists pointed out that the wealth of the country had shrunk 30 billion dollars according to one person's authority, or 40 billions according to somebody else's. Only last year, the stock market became unsettled and by early fall the alarmed economists were pointing out that 25 billion dollars of value had disappeared from our national wealth.

IT SEEMS UNLIKELY that the national wealth really changed much from 1928 to 1932, or that it had changed appreciably between February 1937 and October of the same year. Only the arbitrary values assigned to this wealth changed. Practically all of the things, which after all make up the wealth of a country, remained substantially the same; as available for the potential production of wealth at the depth of the depression, as they did at the peak of the inflation. If a 100,000-spindle cotton mill is running full time and producing cloth, its production of usable goods is exactly the same whether the output is valued at 10 million dollars a year, or 5 million dollars. When we say that the value of the product has been cut in half, all we mean is that the dollar value has been cut in half. The actual useful value remains exactly the same as before.

It should be perfectly obvious that the wealth of a country depends on the useful values created, rather than on the money value attached to its goods and property. Simply raising prices creates no prosperity, and may actually do the reverse, since it creates a false sense of profit which does not really exist. We

live by, and on, Things, and not money, and artificially altering the so-called money value of a thing does not change its useful value, but merely shifts purchasing power from one group to another.

Most of the old-fashioned economists were studying a national economy fundamentally different from ours. Karl Marx, who wrote the gospel of the Socialists and Communists, seemed to have founded most of his observations on a system in which most production was intended for export, and the profits from this production to a very large extent invested in a foreign country for the benefit of the financier and manufacturer so that the working people who participated in the production of goods had little opportunity to participate in their consumption. The profits frequently remained abroad indefinitely. Sometimes, the exigencies of war would result in the return of these profits to the country of origin in the form of supplies and munitions, but since war destroys goods rather than creating them, the working classes who were originally employed to produce this wealth never did get a chance to benefit from any of it in their ordinary everyday life. Under such a system it was natural for employers to force down wages far below the point to which they could ever have been forced if the employer had been obliged to depend on the wage earners for his market. The United States has a relatively small foreign trade with respect to its total business, and practically all of it is balanced. We pay for our necessary imports with exports. With the exception of certain farm products, practically everything produced in the United States is consumed here, and every employed person is in effect producing something for himself or some other employed person to consume. Of course there are a lot of rich people in the United States, but they have to spend or invest their money here almost without exception. The rich people of the United States probably do not send nearly as much of our wealth out of the country as is sent out by the foreign workmen who make money here and then either send or take it back to their country of origin. Most of the wealth we create stays right here in the country and our chief problem is to keep it in useful circulation.

UNDER SUCH AN ECONOMY, it is perfectly evident that every man's wage is some other man's cost of living. It is impossible to raise one man's wages without automatically cutting the wages of some other man, unless the wage raise was based on a participation in the value of increased production. Wages have been consistently on the up-grade in the United States almost ever since we set up in business as a country. They would automatically and inescapably have done this in spite of anything anybody could have done to try to keep them down. They may not have been raised in terms of dollars, but they would automatically have been raised in terms of purchasing power.

For about 20 years, we have been deliberately and consistently trying to get more out of our national economy than we put into it. How much longer can we keep on trying to do this without ruining ourselves? We have tried to do it so far by borrowing from those who were thrifty enough to put something aside out of their increase and using this to maintain our inflation. Of course those who have lent have been given certificates of indebtedness, but these certificates are payable in dollars, and sooner or later a dollar may be nothing but a little piece of paper with some pretty printing on it. We should not forget that only a few years ago newsboys were selling billion mark German notes as souvenirs in many cities, and Russian money was worth about 25 cents a bushel. It can happen here.

Grudges and Personalities

"I see you've got Jack Kowalski listed as one of the men to be laid off," said the works manager to one of his foremen. "Why did you put him on the list?"

The foreman explained that Kowalski was a good enough worker, but had been a disturber and a troublemaker. As long as some men had to be laid off he thought that this would be a good time to get rid of him.

"You know, Charlie," said the manager to the foreman, "I have a notion that you are taking the easy way out in this case. It's true that Kowalski has been sticking his nose into a lot of spots around here, sort of looking for trouble, and I know that he's lodged a couple of complaints against you that have stuck. But, did you ever stop to think that in doing so he has done you a service, and the company, too, because he has uncovered some weaknesses in your tactics? Maybe this fellow Kowalski has really got some good stuff in him. You might gain more by getting really acquainted with him and getting under his skin than by taking this opportunity to put the skids under him. That's something to think about in this case, Charlie."

What factors do you think should be taken into consideration before laying off a man simply because he has been a disturber?

—"Management Information", Elliott Service Co., Inc.

Who Should Go

A foreman was asked by the manager to submit a list of the men he thought should be laid off in a ten per cent reduction of the working force.

This foreman knew that other foremen in the organization were taking advantage of the opportunity to get rid of certain workers they didn't particularly like. He also knew that some foremen were taking care of relatives, lodge brothers and personal favorites by keeping them on the job. This foreman, however, did not want to let personalities influence him.

Sitting in his home that evening, where he was free to do clear thinking, he listed all the qualities a man should possess in order to be a desirable, permanent employee. Then he listed the points which he thought the men themselves would like to have considered, such as length of service, loyalty, and all around ability to do the job. In a third list he noted the factors which should be considered from the point of view of the good of the community, such as number of dependents and place of residence within or outside the boundaries of the town.

Then he considered each man individually in the light of all the factors he had listed. He rated each man on the basis of these factors and formed his judgment upon this impersonal basis.

Suppose you list the factors which should apply in laying off people in your own department.

—"Management Information", Elliott Service Co., Inc.

Japanese Textile Men Renew Import Quota Arrangement for 1939-40

REPRESENTATIVES of the Japanese and American textile industries, at a meeting at the Nippon Club in New York City on Monday, December 19, for 1939 and 1940, renewed the textile import arrangement effected for 1937 and 1938 in Osaka, Japan, on January 22, 1937.

Under the terms of the new arrangement, the Japanese textile industry accepts for the two years, 1939 and 1940, a total quota of 200,000,000 square yards of cotton piece goods of Japanese origin to be shipped to the United States. The basic quota for each of the two years is 100,000,000 square yards, with the proviso that the Japanese may transfer from either year's apportionment into the other any amount not exceeding 20,000,000 square yards. In the event of such a transfer, the quota for the year from which the transfer is made must be reduced by the amount transferred. In other words, with such a transfer, the Japanese may ship, in 1939, as much as 120,000,000 square yards, but if this is done, the 1940 quota automatically is reduced to 80,000,000 square yards, so that the total quota for the two years shall not exceed 200,000,000 square yards.

Except for the amounts of the quota, the other provisions in the understanding effectuated in Osaka between the Japanese manufacturers and the American Textile Mission are automatically renewed. The arrangement applies to all piece goods, the principal element of which is cotton; the full responsibility for its effucuation rests with the Japanese manufacturers; if trans-shipments of goods of Japanese origin, reaching the United States through a third country tend to make the arrangement ineffectual, the amount of such trans-shipments shall be deducted from the total amount of quota.

The original document, covering 1937 and 1938, and signed in Osaka in January 1937 by Claudius Murchison, representing the American interests, and O. Shoji, representing the Japanese, provided a quota for 1937 of 155,000,000 square yards, and, for 1938, a quota of 100,000,000 square yards—a total for the two years of 255,000,000 square yards. Thus the renewal arrangement represents a reduction in the quota, for the two years, of 55,000,000 square yards. The 1937 quota represented the amount of orders in the hands of Japanese mills on January 20, 1937, for 1937 delivery.

A joint committee of Japanese and American interests was established by the Osaka conference for effectuating and renewing the original document. Authentic figures demonstrate that arrivals of Japanese goods during 1937 and 1938 were materially below the maximums allowed by the quotas. The representatives in America on the joint committee are: Japanese representatives—H. Yoshida, New York manager of Mitsui & Co., Ltd., and T. Inouye, commercial secretary of the Japanese Embassy; American members—Claudius Murchison, president of The Cotton-Textile Institute, F. S. Blanchard, of Pacific Mills, and G. Edward Buxton, of New England Industries, Inc. These gentlemen, with B. Oshima, assistant to Mr. Inouye, were present at the function at the Nippon Club on December 19, at which the renewal understanding was signed.

Also present were: Paul B. Halstead, secretary-treasurer of the Cotton-Textile Institute; and Harry L. Bailey, president of Wellington, Sears Co., New York, and Robert W. Philip, Editor of COTTON, Atlanta, who were two of the members of the original American Textile Mission to Japan in 1937.

Left to right, around the table: T. Inouye, H. Yoshida, Paul B. Halstead, B. Oshima, Robert W. Philip, Harry L. Bailey, F. S. Blanchard, Claudius Murchison, and G. Edward Buxton . . . .

A Survey on Filling Quills—

RECENTLY AT THE REQUEST of a southern mill man, the Editorial department of COTTON conducted a survey among a few selected mills to ascertain the practice, preference, life, and other pertinent data in the use of filling quills. The response showed that there is much interest in the subject, but that little thought has been given to it. In any survey it is necessary to have a complete cross section of the problem to make it representative.

The accompanying tables give the compiled answers to a questionnaire from 39 mills in the South. Often, after a survey has been made, it is discovered that many important factors have been omitted, but in this case, just about everything of import concerning a filling quill has been asked except "where do you buy them" and "where do you throw them when they are no longer serviceable", which, after all, might have been a good question to include.

The center of interest in the survey is, naturally, the life of a quill under manufacturing conditions. To get the answers to a comparable figure it was necessary to calculate each mill's answer by the same formula. Thus arose the question of the best formula—or any formula to use. Some of the mills answering tended to guess at the life, some used the replacement percentage each year, and several men concocted their own formulas. The discrepancy of calculating the life of quills in one mill by a different method from that used for calculating the life of those in another is evident—the answers would be meaningless.

One man offered the formula:

$$\frac{\text{No. quills replaced (yearly)} \times \text{Average time (in minutes) between transfers}}{\text{Loom hours of operation} \times \text{Average r.p.m. of looms}}$$

that gives a figure which he called the *coefficient of replacement*, or *quill life factor*. However, this formula assumes that the life of a quill is proportional to the number of times it is transferred at the battery. It is known that other factors affect the time that elapses before a quill is discarded, so in order not to be misleading this formula was not adopted. However, it was the basis upon which to work in securing a formula, as will be seen, and the fundamentals were retained. It is known that the number of transfers a quill passes through directly affects the life of that quill, but to use *only* that factor would mean that a quill which is not subjected to the transfers would last indefinitely. *Warp* bobbins do wear out, we know.

Quoting from a letter which passed during the survey we get one man's opinion on this subject: "We believe it is almost impossible to set up a formula by which the life of quills may be calculated because there are so many factors that affect the life. The formula that you prepared [as given previously] is as nearly accurate as any we have ever found, but the fact remains that your formula only takes into consideration that the life of the quill is affected by the number of transfers at the loom. In other words, we have found so many items that tend to lower the life of a quill that it would hardly be a fair comparison to

MILL Nº	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. TOTAL FILLING SPINDLES	32,704	20,500	8,320	38,500	23,848	56,672	27,344	24,896	3808	15,129	24,192	40,116	10,240	8,424	27,876	106,763	36,000
2. TOTAL LOOMS SUPPLIED BY SPINDLES	1403	1291	621	800	1160	2757	1679	1369	216	1400	1462	2,358	500	526	812	4814	1900
3. TOTAL FILLING QUILLS IN USE	300,000	162,840	—	150,000	200,000	400,000	150,000	400,000	40,000	180,000	400,000	500,000	90,000	59,000	250,000	850,000	400,000
4. (a) RANGE OF FILLING COUNTS (b) TIME FOR FILLING TO RUN OFF QUILL IN LOOM	210 to 440 6-7½	100 to 190 4½	60 & 170 265 min.	60 to 1000 10	390 to 415½ 7½	300 to 400 8-9	260 to 390 7	180 to 450 8	190 to 250 5½	100 to 205 5 to 7	320 to 440 6½	270 to 420 3½	260 7½-8	270 to 420 9	270 to 420 5	410 to 446 9	460 to 1300 —
5. TYPE LOOM—BATTERY, MAGAZINE, SHUTTLE CHANGING SPEEDS	Bat. 178	Bat. 165	Bat. 165-155	Bat 160	Bat. 162	Bat. 155-195	Bat. 160	Bat. 160	Bat. 160	Bat 170	(Bat 1312) (Mag 150) 163-140	Bat 165	Bat. 170	Bat. 165	Bat. 160	Bat. 192-460	Bat. 1306-1380
6. LOOM HOURS OPERATED PER WEEK	112,240	103,840	49,680	64,000	92,800	227,200	134,320	109,520	17,280	112,000	116,960	226,7??	43,750	42,080	52,960	384,120	152,000
7. LONG OR SHORT QUILL CAN AT LOOMS	short	short	long	long	short	short	both	long	short	long	long	both	long	short	long	short	both
8. TIMES QUILLS COLLECTED AT LOOM (80 HRS)	20	20	30	10	20	20	20	10	16	40	40	20	20	20	10	16	20
9. FEELER OR FILLING FORK	fork	fork	feeler	feeler	both	fork	both	both	fork	feeler	feeler	both	fork	fork	both	fork	both
10. QUILLS PICKED UP AT REGULAR INTERVALS BY WHOM HOW OFTEN IN 8 HOURS	? man 4	Cot Seed —	Cot Seed fill man all time	sweeper 1	fill man as take up	fill man 1	fill man 4	sweeper 1	no —	sweeper all time	guill man 4	sweeper 1	sweeper 1	— 2	— 4	oiler 4	no —
11. WHERE DO QUILLS CAUSE 1ST TROUBLE	weave	weave	weave	weave	spin	weave	both	—	weave	weave	weave	weave	weave	spin	spin	weave	weave
12. CLUTCH OR ACORN SPINDLE WHICH DO YOU PREFER?	acorn acorn for fill clutch for warp	acorn acorn	acorn acorn	acorn acorn	acorn clutch	clutch clutch	acorn acorn	acorn acorn	acorn acorn	acorn acorn	both clutch	acorn clutch	acorn acorn	acorn —	acorn clutch	clutch clutch	acorn acorn
13. (a) DO YOU USE BOBBIN STRIPPER (b) PUSHER OR PULLER (c) QUILLS BROKEN PER 100,000	used puller —	yes puller —	yes puller —	yes puller 5	no —	no —	yes puller 8 or 10	yes puller 20 to 30	no —	no —	yes puller 60	used puller —	yes puller few	yes puller ½ quill	yes puller —	yes puller —	yes puller 20 to 40
14. FILLING CONDITIONED—BY WATER OR CHEMICAL	no	no	chem	chem	no	chem	chem	no	no	chem	both	both	no	chem	no	no	chem
15. FINISH—HARD BAKED OR OIL-SHELLAC	oil + Shel	oil shel	oil shel	enamel	oil shel	hard baked	both	oil shel	oil shel	oil shel	hard baked	oil shel	oil shel	oil shel	both	oil shel	hard baked
16. PLAIN OR BRASS BUSHING IN BASE " " " " " TOP BARREL PREFER PLN. OR BRS. BSH. IN BASE " " " " " " TOP BARREL	plain plain brass plain	plain plain plain plain	brass — brass plain	brass — brass brass	plain — — —	brass plain brass plain	brass plain brass plain	brass plain — plain	brass plain brass plain	brass plain brass plain	brass plain brass plain	brass plain brass plain	brass plain brass plain	brass plain brass —	brass plain brass —	brass plain brass plain	brass plain brass plain
17. DO QUILLS HAVE PLAIN OR BRASS TIP? DO YOU PREFER " " " "?	plain plain	plain plain	plain plain	plain plain	plain plain	plain plain	plain plain	plain —	plain plain	plain plain	plain brass	plain plain	plain plain	plain plain	plain —	plain plain	plain plain
18. PERCENT QUILLS BOUGHT EACH YR.	16%	13%	—	15%	5%	25%	10%	10%	12½%	20%	15%	20%	16⅔%	25%	10%	15%	15 to 20%
19. WHAT IS AVG. LIFE IN LOOM HRS. AS FIGURED BY FORMULA *	125	245	—	142	464	164	447	137	173	155	97	113	437	168	106	150	108
20. BARRELS STEPPED, RIBBED, GROOVED WHICH DO YOU PREFER?	stepped stepped	stepped stepped	groove groove	ribbed ribbed	stepped stepped	rib + groove grooved	rib + step step	rib rib	grooved grooved	grooved —	grooved grooved	ribbed ribbed	ribbed ribbed	ribbed ribbed	ribbed step	step grooved	[illegible]
21. APPROXIMATE % QUILLS BROKEN BY TRUCK ETC.	—	—	—	½ quill per loom per week	—	30% from 70% from	—	10%	.06%	—	10% Ginder 25% Fill 65% Truck	5%	—	—	—	—	—
22. QUILLS MADE OF BIRCH OR MAPLE. WHICH DO YOU PREFER?	maple maple	maple maple	maple maple	maple maple	maple maple	? birch	birch birch	maple maple	maple maple	maple maple	birch maple	maple maple	maple maple	— maple	— maple	maple maple	maple maple

* $\frac{\text{LOOM HOURS PER YEAR (50 WEEKS)} \times \text{NUMBER OF YEARS TO REPLACE ALL QUILLS}}{\text{TOTAL NUMBER OF QUILLS ON HAND}} = \text{LIFE OF QUILL IN LOOM HOURS}$

LIFE, PRACTICE, AND PREFERENCE

use just one of them—namely, the number of transfers or the detrimental effect of the transfer hammer on the quill, proportional to the speed of the loom. It probably would take Newton a lifetime to devise such a formula that would satisfy any of us."

With these thoughts in mind the formula:

$$\frac{\text{Loom hours per year (50 weeks)} \times \text{Number of years to replace all quills}}{\text{Total number of quills on hand}}$$

was adopted. This came about, with all due respect to the other formula, not because it was a better formula, but because, like the weather, nothing else could be done about it. The life of a quill as calculated by this formula is given in the lower left hand corner of the accompanying chart.

Using this formula, the life of quills in the various mills was calculated, but *the reader must inspect the accompanying charted answers to the questionnaire to ascertain the cause of difference in the life of quills.*

For instance, it was noted by one mill man that where quills have no brass bushing in the base and the filling is conditioned improperly, the quills swell and will not fit the spindle and must be discarded. Other men mentioned that the quill suffers most when it is transferred at the battery. One man emphasized that the quills must fit the spindle properly so that they would not have to be driven on the spindle.

Another thing brought out was that a certain kind of battery is available that will seldom break the quills on the transfer.

One contributor to the survey was replacing all quills at one time, so in a few years he will be able to give some definite information as to their life. More than one man would probably like to run the same test, not only with quills, but with other supplies and equipment.

An effort was made to find the number of quills per spindle in the mills and this was found to vary from 41 quills per spindle in a mill that makes filling counts from 2.75s to 8s/5, to 3 quills per spindle in a mill that makes filling counts from 29s to 44s. The average of all the mills was 11.3 quills per spindle.

Another question was asked to ascertain the number of quills per loom; this was found to average 183 filling quills per loom. However, the total number of quills serving one loom ranged all the way from 54 to 410. Most of the mills had from 145 to 200 quills per loom. One company which manufactures quills suggests that 250 quills be kept as inventory for each loom.

A careful digest of the survey should prove interesting, though few comments will be made to try to explain the results.

Of the 39 mills responding to the questionnaire, 35 had only bobbin changing looms, three had both bobbin changing and magazine looms, and one had bobbin changing and hand changing looms.

At the loom, 12 mills used the short quill can, 17 employed the long can, and 9 had both the long and

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	
40,000	25,504	16,000	23,136	17,830	27,600	11952	13,728	37,296	varies	7,980	27,360	28,608	10,000	5,728	3624	44,096	43,728	7,616		34016	53,520	1
2210	1336	700	1381	936	1413	782	1152	1792	220	969	1431	2488	952	407	450	2274	3,108	400		1963	2588	2
120000	150,000	100,000	100,000	90,000	—	150,000	180,000	150,000	80,000	750,000	239,000	385,000	—	150,000	150,000	400,000	1,270,000	70,000	400,000	180,000	336,440	3
29to44	38644	40s	42to45s	40to43s	40to41s	36to26s	8/5to7/0	40to46s	1½to2½	6to26s	42½s	40to26s	36to21s	28to24½	36to8/5	40s	28to24s	13to23	35to45s	11to40s	42s	4
7	9	5½	9	—	8½	5	8	11½	2	5	11.5	4	—	—	3	10½	5	4	9		12	4
Bal.	Bal.	Bal.	Bal.	Bal.	Bal	Bal.	Bal.	Bal.	Bal.	Mag 40 Bal 40	Bal.	Bal.	Bal	Bal.	(mag. Bal.)	Bal.	Bal.	Bal	Bal.	Bal	(2 Mag Bal)	5
164	160	155	155-172	—	165-170	172	178	164	96	168-147	175-161	100&184	108&145	145	90-156	169	153	160	160	145-171	160	
176,800	160,320	66000	110,480	74,880	113,040	31,230	92,160	215,040	17,600	77,520	171,720	200,000	72,000	32,560	40,000	181,920	248,640	32,000	—	157,040	207,040	6
short	both	long	both	long	both	both	long	—	long	long	short	long	long	both	long	short	long	short	long	both	short	7
10	10	25	20	20	10+5	40	100	3	10	10	10	ordinarily	32	50	hardly	10	10	20	12	20	10	8
fork	both	feeler	both	fork	fork	fork	feeler	fork	feeler	feeler	both	feeler	feeler	feeler	feeler	both	feeler	fork	feeler	both	fork	9
sweeper	guill man	—	guill man	klen sweeper guill man	all	fill man	guill man	bat hand	sing one as I see a	sweeper	sweeper	sing one as I see	fill man	fill man	—	very one a once		all continuously		sweeper		10
4	1	—	1	4	—	4	1	8	—	4	1	—	4	9	as they fall	—		—	daily	½	1	
weave	weave	weave	weave	spin	spin	weave	both	weave	spin	spin	weave	weave	weave	weave	weave	weave	spin	weave	weave	weave	weave	11
acorn	acorn	acorn	acorn	acorn	acorn	acorn	acorn	acorn	acorn	clutch	clutch	clutch	clutch	both	both	—	acorn	acorn	acorn	clutch	acorn	12
acorn	acorn	—	clutch	acorn	clutch	acorn	both	acorn	acorn	clutch	—	clutch	clutch	acorn	clutch	acorn		clutch	acorn	clutch	—	
yes feeler	yes feeler	yes both	yes feeler	yes feeler	yes feeler	no	yes feeler	no	no	yes feeler	yes	no	yes feeler	no	yes feeler	yes feeler	yes	no	yes both 12to15	yes feeler 25	yes feeler	13
	—	1¾	40	10	—	—	3.33	—	—	77	—	—	—	—	—	—	10					
chem	chem	chem	chem	no	no	no	chem	no	single water	no	chem	water	chem	chem	no	no	chem	no	chem	chem	no	14
oil+chl	oil+chl	oil+chl	oil+chl	oil+chl	oil+chl	oil+chl	oil+chl	oil+chl	hard baked	oil+chl	oil+chl	oil+chl	—	oil+chl	oil+chl	oil+chl	hard baked	oil+chl	oil+chl	both	oil+chl	15
plain	brass	brass	both	brass	plain	brass	brass	plain	brass	brass	brass	brass	both	brass	both	brass	brass	plain	brass	brass	brass	16
plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	plain	
plain	brass	brass	brass	brass	brass	brass	brass	—	brass	brass	brass	brass	plain	brass	plain	brass	brass	brass	brass	brass	brass	
plain	plain	plain	plain	plain	plain	plain	plain	—	plain	plain	plain	plain	none	plain	plain	plain	plain	plain	plain	plain	plain	
plain	plain	plain	plain	plain	plain	brass	plain	plain	plain	plain	plain	brass	plain	both	plain	plain	plain	plain	plain	plain	plain	17
plain	plain	plain	plain	plain	brass	brass	—	plain	plain	plain	plain	brass	plain	plain	plain	plain	plain	plain	brass	plain	plain	
33%	20%	6.5%	20%	5%	—	—	35%	6.6%	11%	10%	12½%	4½%	—	6½%	6½%	23%	11%	22%	20%	33%		18
221	267	432	276	831	—		73	1075	99	52	287	576	—	167	205	99	88	104		131		19
ribbed	ribbed	grooved	grooved	ribbed	step	rib	grooved	step	rib	step	grooved	grooved	ribbed	grooved	grooved	rib	rib	grooved	grooved	both	grooved	20
	grooved	grooved	grooved		grooved	rib	grooved	step	rib	step	grooved	grooved	ribbed	grooved	grooved	grooved	grooved	grooved	grooved	grooved	grooved	
—	—	—	—	—	—	—	—	9/8 for rib	—	—	—	—	—	—	—	—	1%	—				21
maple	maple	maple	maple	maple	birch	maple	maple	birch	both	birch	maple	birch	maple	maple	maple	maple	maple	maple	maple	maple	maple	22
maple	maple	maple	maple	maple	birch	maple	maple	maple	maple	birch	maple	birch	maple	maple	maple	maple	maple	sap maple		maple	maple	

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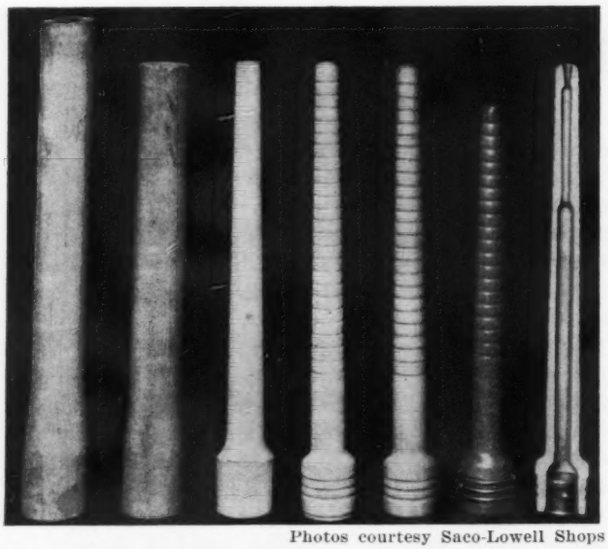


Photos courtesy Saco-Lowell Shops

Illustrating the various stages of manufacturing the finished filling quill . . . . . .

the short quill can. Of the 12 that used the short can, 6 had the quills taken up 20 times a week (80 hours), 4 of them 10 times, and two 16 times. Of those mills equipped with the long quill cans, 3 of them emptied the cans 40 times a week, one 32 times, one 30, and one 25 times. One mill had the cans dumped hourly and another wrote "continuously", which could be interpreted any way the reader desires. From this it might be gathered that possibly the mills using the long can preferred to give the bobbin farther to travel when the filling change occurred and the quill was knocked into the can, thus permitting the tail of yarn on the quill to be drawn into the can with the quill; by dumping the cans more often the quill had farther to fall. In almost every instance, the mills having their looms equipped with feelers used the long quill can, substantiating the foregoing statement of possibility.

Three mills have the battery hand pick the empty quills off the floor when they are knocked there by the transfer or arrive there by other means. Nine require the sweeper to pick up the quills and one replied "anyone" and one "everyone". Keeping the quills off the floor, where they may be damaged by feet, trucks, etc., is an important factor in the life of quills. Most mills think it is advisable to have one person delegated to pick up the quills at all times. If the sweeper makes enough rounds during the day then he will be able to do this, if not, the battery hand covers the alleys more often and has the opportunity to spy the quills lying on the floor and can get them. Some mills require the battery hands to work down the alley filling the batteries and then return via the back alley to pick up the quills that have been thrown behind the looms. As anarchism is *theoretically* the most perfect form of government, so *theoretically* the most perfect way to keep the quills off the floor is to have *everyone* pick them up. But as anarchism does not work, neither does the method of having everyone pick up the quills prove successful.

Every so often the overseer of weaving remembers that he should clean from under the looms. Then he gets his sweepers down on a Saturday morning and they pull out from under the looms a bizarre collection of objects such as broken pick ball caps, nuts and bolts, crusts of bread, shoes, bottles, leather, aprons, and quills. The overseer piles all this at the end of each line of looms and instructs the operatives to claim their personal effects, hopes the loom fixers will pick out a few of the usable parts, and returns the quills to the spinning room, only to have that overseer rebuke him for sending scaly and dirty quills to him and ironically suggest that he clean from under his looms at least every two years whether they need it or not.

28 mills discovered that the quills caused trouble first in the weave room. Spinners and weavers could argue this point for several days and not arrive at any satisfactory reason why each other should not discover the faulty quills first.

A preponderance of the mills taking part in the survey were equipped with acorn spindles though some of them preferred the clutch type.

Most of the mills were equipped with the puller type of bobbin stripper but few had kept records of the number of quills broken by the stripper. One contributor advised that he was acquainted with a bobbin stripper that was neither a pusher nor a puller.

Slightly more than half of the mills conditioned their filling before running it. Of the types of finishes on the quills, the oil-and-shellac combination finish appeared to be most popular.

According to the survey, quills were preferred that had brass bushings in the base, but with the inside of the barrels plain and without the brass tip on the outside of the quill. Maple quills were preferred to birch, and the grooved quill held precedence over the ribbed and stripped.

The percentage of quill replacements per year varied considerably among the mills. One man who saw the survey as it was being compiled stated that

THOUGH the bobbin or quill is one of the most essential accessories to the operation of a mill, it receives little care and thought on the part of the operatives and executives. From the treasurer, who hates to buy them, to the sweeper, who finds their presence on the floor a constant source of back-straining pains as he picks them up, they are accepted with a spirit of resignation and regarded as a necessary evil. Yet the condition of the quills and the care and skill used in the selection of the raw materials and in their manufacture have a direct result on their efficiency in the mill.

Great advances have been made in the selection of material and in the accuracy of manufacture. Quills may be made of plastics, metals, and wood, of which the rock maple, birch, beech, and gum have proven most desirable. The principal finishes for the quills are oil, shellac, oil and shellac, and enamel. Some filling quills have a metal tip as well as the regular bushing and shield. This tip prevents wear, helps prevent the breakage of filling, keeps the quills at a uniform length, and eliminates the expense incidental to sanding and polishing the rough quills.

Extracted by permission from "The Saco-Lowell Bulletin", December 1937.

he gives orders for a million quills at one time, shipments to be made periodically for a certain percentage—and supplemented occasionally if necessary. He found this plan to work well and recommends it to others.

Surveys of practical problems are always interesting. Besides giving information, without revealing the source, concerning a problem, they help the mill man contributing to them because he secures certain data that ordinarily he did not have prior to answering the questionnaire. However, in any survey, it is suggested that we consider the general trend of the average answers instead of the extreme cases if we are to arrive at a fair decision on any of the component points.

In commenting on a survey of this type, it is impossible for one man or several to bring to light all of the important points and to give the proper interpretation of them. Each man will find the survey of especial interest to him along a different channel. Thus, with this thought in mind, we present to you—the survey as is. Your own analysis will prove more helpful to you than ours.

Upon distribution of the survey to those mills taking part in it, several comments were made concerning conditions that affect the life of the quills.

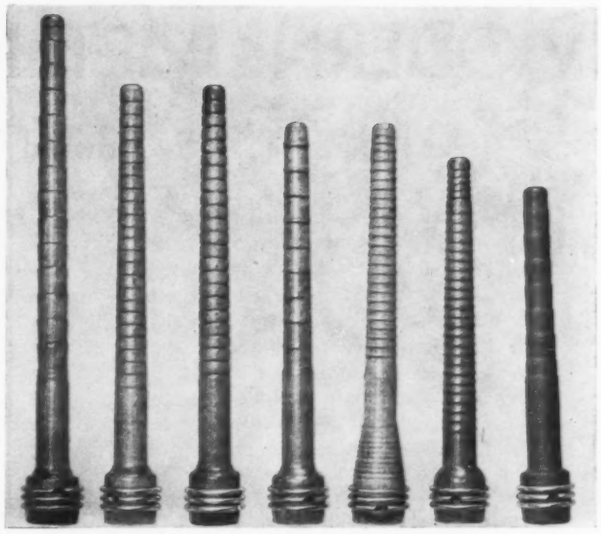
"Quills last longer in one plant than they do in another because of: 1. The personal opinion of the different mill men who have the authority to say when a quill should be run and when it should be thrown away, or the amount of money a mill has to spend for replacements. 2. The type and quality of the quills that are being purchased by the different mills. 3. The method of training the operatives so they will not be destructive. 4. The condition of the looms and the type of quill cleaning that is used."

"The ratio of total quills on hand to the number used per week affects the life of the quill materially. At one mill where I was superintendent the filling was very coarse, causing the quill to be transferred about once a minute; consequently the life of these quills was greatly shortened. At the mill where I am now the numbers are comparatively much finer and are not transferred as quickly in the loom; consequently, they last much longer."

"Some of the factors having a bearing on the life of the quills. 1. Failure to clean quills often enough will allow the barrels to become clogged with accumulated lint and the resulting difficulty in putting them on the spindles may cause many to be broken when the doffer exerts undue force in pressing them on the spindle. 2. An ample or surplus supply of quills will enable them to be handled less frequently, thus prolonging the life of the quills as well as the quill cans."

"Properly adjusted pitman arms will prevent quills from rolling in the shuttle from the back or front thereby preventing wear on the quills. Properly boxed shuttles will prevent the shuttles from bouncing and will prevent damaged quills upon the transfer. Properly adjusted transferers will keep the quills from going too deep or too shallow."

"If quills fit the spindle properly and don't have to be driven down, they will last very much longer."



Each mill has a special preference for a type of filling quill. Shown here are some of those in use.

"The largest governing factor in the life of a quill is the length of time it runs in the shuttle (everything else being equal). If it only runs one minute in the shuttle, it completes the trip from the spinning room to the loom and back much faster than if it runs 5 minutes in the shuttle."

"There are so many factors governing the life of filling quills that I don't believe any exact formula can be used in computing the life. However, the formula adopted seems to be as good as any. Anyhow, even if the formula does not give us the average life, it does give us a comparative figure to apply to other mills. I think all the other information given in the survey is interesting and important data."

"After looking over the survey on filling quills, I think a number of factors affect the life of quills. They are quills on hand, minutes to empty quill in the shuttle, loom hours operated, average speed of the loom, average number of filling yarn, type spinning spindle, type of transferring device, and type of quill cleaner."

"After looking over the survey on filling quills I called our overseer of spinning and overseer of weaving into the office to decide on the factors affecting the quill life so that we could eliminate as many as we could. We found so many things that will make a quill wear out or get broken or lost that we are surprised they last more than a day. Quills are used for everything from propping open the windows in the spinning room to separating stuck ends in a warp on the loom. Even the slasher room tenders use them to scotch their beams."

"First class loom fixing will help reduce broken quills. Also, the quill cleaning machines should be kept in good working order, and not forgotten once they are installed."

"Every suggestion should be given careful consideration. Don't cool the coals of creativeness by covering them with a wet blanket."

* * * * *

"A man can be excused for falling down on a job but there is no excuse for lying down on it."

* * * * *

"You can always win an argument by avoiding it."

MODERN METHODS OF DYEING

By Edward W. Pierce*

IN THE first article, in the December issue, Dr. Pierce began this series with a discussion of colors and a development of the color sense.

Here he describes the various types of textile fibers, and their dyeing characteristics, and outlines briefly the general types of equipment for dyeing loose fibers, yarns, and piece goods.

Next month, starting with the basic dyestuffs, he will start a discussion of the different types of dyestuffs and auxiliary materials . . . . . .

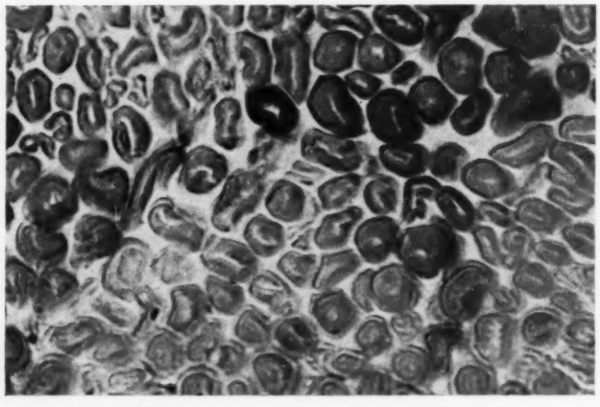
Article 2—Textile Fibers and Mechanical Equipment

WHILE volumes have been written concerning the structure and the chemical composition of the various textile fibers, all of which are easily available to those who want to make a more scientific study of the subject, yet for the practical man a much more superficial knowledge will be quite sufficient to aid him to understand how to carry on his work and to plan his course of procedure. At this time designers are putting out various mixtures of fibers in the same fabric, so no dyer can be sure that he will never encounter any other fibers than those with which he is familiar. In dyeing, as in all important industries, the value of any man lies in his familiarity with the entire subject and not only with a knowledge of one restricted specialty.

A rough classification of fibers divides them into animal and vegetable fibers, but this is not sufficient, for we now have some new synthetic fibers which must be considered by themselves.

Wool is the principal animal fiber and is typical of the class as a whole, which includes the wool or hair from a diversity of animals such as camels, alpaca, vicuna, Angora goats (mohair), rabbits and the various animals whose fur is used by hatters. The main differences between these are their varying affinity for dyestuffs, luster and original color. Chemically, the animal fibers are amino acids, that is, they partake at the same time of a basic and acid nature and may be dyed with either acid or basic dyes, although custom has now practically abandoned the basic dyes. The animal fibers in general have a good resistance to solutions of even the strong mineral acids after prolonged boiling, but are very sensitive to alkalies, which causes their speedy deterioration. Even wools from different parts of the world as well as wool from different parts of the same sheep will show varying degrees of affinity for dyes and may not be mixed in a fabric which is expected to show a level, well-covered shade. Shoddy and noils show the same characteristics as virgin wool, but are in a somewhat damaged condition on account of the severe mechanical handling they have received.

Silk is the next animal fiber and is encountered in several varieties. True Japanese silk is the highest grade and occurs in very long continuous fibers of high luster, that is after boiling-off, for it is naturally coated with a gum which stiffens and dulls it, but after this has been removed by an hour's boil-off, the true fiber beneath shows its real appearance and is ready for dyeing. Spun silk is obtained from



*Technician, Ciba Co., Inc.

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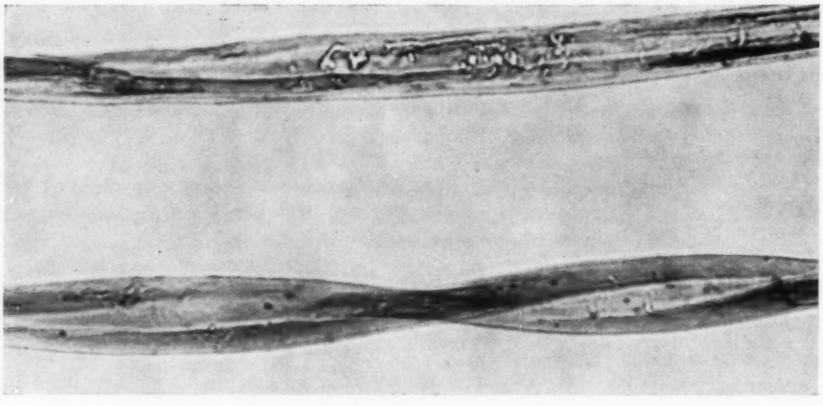
(This series comprises abstracts of lectures delivered for several consecutive years to students in the art of dyeing, revised to adapt them to the general textile reader.)



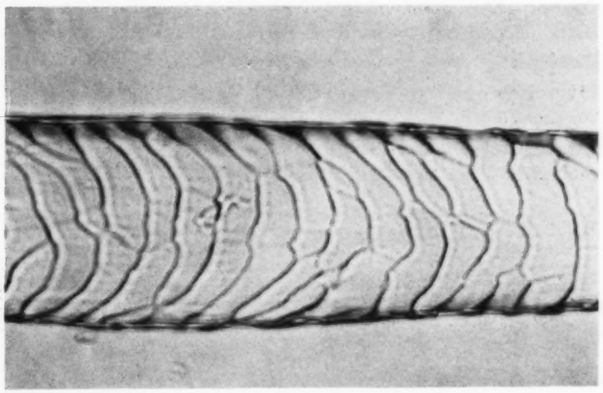
The photomicrographs used with this article showing various textile fibers longitudinally and in cross-section are reproduced through the courtesy of the Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C., from whose files they are taken.

Above, cross-section of mercerized cotton × 500 . .

At left, longitudinal view of mercerized cotton × 500.

the perforated cocoons, from which the moths have emerged and which have been torn apart in a picker and spun like cotton; it has the original chemical properties of silk but is deficient in luster and smoothness. Silk behaves somewhat like wool but has not the resistance to strong acids, yet has more resistance to alkalies, except caustic soda and potash. Then there are the wild silks, like Tussah silk; all of these have fibers which, instead of being smooth, are fluted and so cause all of the shades dyed on them to appear smoky and deficient in brilliancy, otherwise they have the same general properties as true silk.

The vegetable fibers are often classified as seed hairs and bast fiber, but this has reference only to their origin. We know that cotton is the seed hair

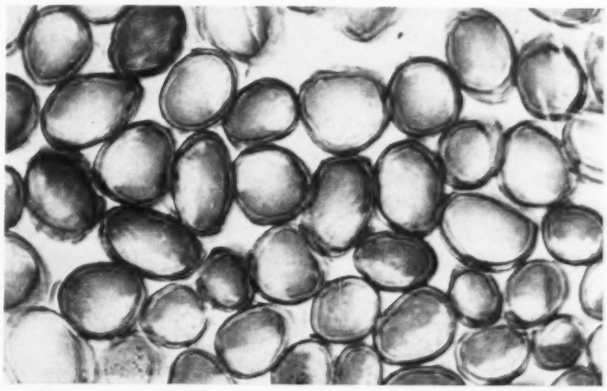


Wool fibers showing surface structure (magnification 500 times) . . . . . .

of the cotton plant and that linen, hemp, jute and ramie are the fibrous cells of the plant stalks, but this does not take into account the difference in their behavior toward dyes. A better classification takes into account the fact that they are composed of fairly pure alpha cellulose, as in the case of cotton, or that they also contain lignified cellulose like linen and the other bast fibers. Lignin is found in its most concentrated form in the very hard woods like lignum vitae or coca bola wood. All woods contain much lignin, but they also contain alpha cellulose. The bast fibers contain enough lignin mixed with their cellulose to impart an affinity for basic dyes which we do not find in cotton.

In the case of cotton, we find that different varieties show varying affinities for direct dyestuffs; not only are there notable variations shown between the types known as Sea Island, peeler, domestic and Egyptian, but even cotton from different localities, supposed to be of the same variety, will show color differences after dyeing. This is often noted in mills where pieces are dyed and shows itself by causing bars of lighter or darker filling wherever the substitution of another lot of cotton has occurred. Pieces sewed end-to-end in the grey room and run through a bleachery will show color differences in adjacent pieces when the finished dyed goods are examined. Sometimes this is ascribed to the fact that the raw cotton bales had been subjected to different climatic conditions before spinning. It is a well-recognized fact that blue bend cotton is especially obstinate in its behavior toward dyes.

Mercerizing in a strong cold caustic soda solution removes many of the impurities from the fiber and generally overcomes many of the differences



Cross-section of Ohio merino wool fibers (magnification 500 times) . . . . . .

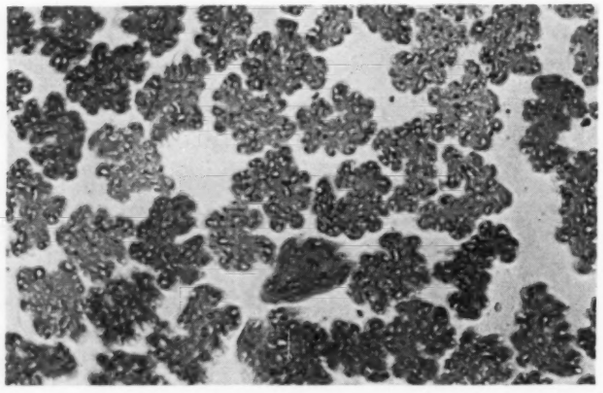
found in cottons, but when the cotton in a fabric is from many sources, there will always be dyehouse troubles that are certainly not the fault of the dyer.

The synthetic fibers or rayons are of several classes. Those representing regenerated cellulose are made by the viscose process, the cuprammonium process and the nitrocellulose process. While the ultimate product is chemically cellulose, yet we find them to possess different affinities for dyestuffs from cotton. The rayon from the nitrocellulose process has a much lower affinity for direct dyes than cotton, that from the viscose process has more than cotton, while the rayon from the cuprammonium process has the greatest affinity of all. This is explained by the physical arrangement of the small particles composing the fiber, which have also fine crevices and spaces between them, for the dyes to enter and become enmeshed, this being the most modern theory concerning the action of dyes on fibers. All the cellulose products have about the same chemical reactions; they cannot endure strong acids without becoming weak or being destroyed entirely, but can endure strong concentrations of even caustic soda. Cotton treated with strong cold caustic soda, under tension, tends to shrink, but develops a high luster and an increased affinity for dyestuffs, but this is explained by the change in the physical alteration of the surface of the fiber, rather than by any change in the chemical nature of the cellulose.

Beside regenerated celluloses we have synthetic fibers made of what are known as cellulose esters, such as cellulose acetate rayon. These fibers show entirely different behavior with dyestuffs from either cotton or the ordinary rayons. They are generally left untinted by the general run of cotton dyes, but dye to full shades with special dyestuffs which are made for this particular purpose. When a dyeing has been done and the fiber is examined under a powerful microscope, it is seen that the dye has apparently been dissolved by the solid fiber, just as blue cobalt glass is colored by dissolving oxide

of cobalt in it. Acetate rayon is sensitive to alkalies in high concentration and at temperatures above 180 degrees F. when it is saponified and becomes regenerated cellulose and again acquires an affinity for direct dyestuffs.

All of the synthetic fibers are now put on the market in the form of cut staple; some grades are cut to the length of good long staple cotton, while others are cut to resemble fine worsted and are worked up according to cotton mill or worsted mill procedure. They are mixed with wool or worsted and may be dyed before mixing or after weaving. Lately a new synthetic fiber has made its appearance, it being an imitator of wool in appearance and somewhat related chemically. It is made from casein, from skimmed milk, fixed with formaldehyde. It



Cross-section of viscose rayon fibers (semi-dull) magnified 500 times . . . . . .

dyes like wool and has a good appearance but is somewhat lacking in tensile strength. Formerly all the synthetic fibers had the defect of too glassy an appearance, but now most of the productions are made with a delustering agent incorporated in the fiber, which tends to make them appear more chalky, although there are some grades which are only partly delustered. The only effect the delustering has on the dyeing is that the dyeings will lack in brilliancy.

Types of Dyeing Equipment

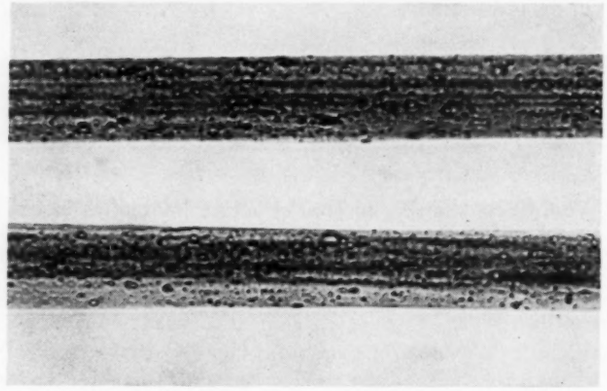
The textile fibers come to the dyer in several different forms and must be dyed accordingly. This involves the use of a diversity of mechanical appliances, which are necessary to handle properly the goods that are being dyed. First we have the loose materials such as raw cotton, loose wool, rayon waste, silk noils and we might include slubbing made from both worsted and cut rayon staple, although these are in a partly manufactured state.

The most primitive way of handling loose materials is in a deep cylindrical tub or kettle, having a false bottom, under which is the steam pipe; the mechanical action is then supplied by hand labor, men poling the lot with long stout poles. An improvement over the plain kettle has a central pipe with a hood over the top, so the set-up operates very much like a coffee percolator and dispenses with the poling. It can easily be seen that neither of these devices is calculated to produce perfectly uniform dye lots, and so many attempts have been made to improve the output by mechanical assistance.

The first machines developed were of the type that use a rotary drum with compartments, revolving in an outer box which contains the dye liquor. There are still many of such machines in use and are often preferred by some dyers for their work. It is not advisable to mention any of the dyeing machines by name, because there are always manufacturers of similar machines who will feel that they too should be given the same amount of publicity.

Dyeing Loose Fibers

Following the revolving type of machine for dyeing loose fiber, we next encounter those in which the material remains still and the liquors are circulated through the mass. One type uses a rectangular box with a false bottom and an end compartment in which there are screw propellor blades which circulate the dye liquor. In such a machine the loose stock cannot be packed too tightly or it would be impossible to force the dye through it uniformly. At present these machines have either a cylindrical or rectangular contain-



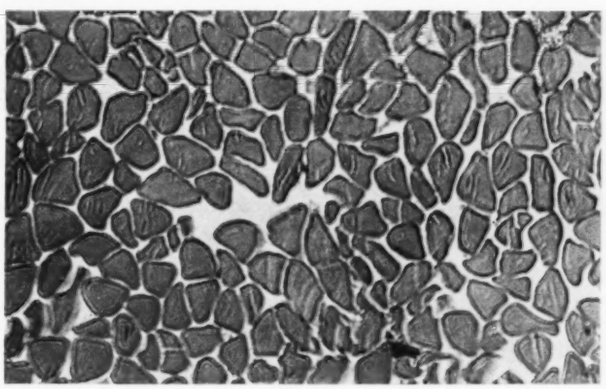
Longitudinal view of viscose rayon fibers (semi-dull). Photomicrographic magnification, 500 times . . .

er for the stock and the dye liquor is circulated both ways alternately by means of either a gear or a centrifugal pump. These machines differ mostly in the shape of the container, the expansion tank which acts as a reserve for surplus liquor, the material from which it is constructed, the type of pump and the method of unloading. Naturally all the machines of the circulating type will deliver the dyed material without its being matted and felted and so save much wear and tear while it is being prepared for spinning.

Slubbing or tops, whether of worsted or cut rayon staple, are generally dyed in balls in a series of cans, which are placed in a tank in rows and the dye liquor circulated in both directions by means of a pump. The latest development for dyeing rayon staple tops consists of a metal shell, around which the slubbing is wound, as on a spool. This fits into a container and a pump circulates the dye through the mass of material in both directions, then it may be rinsed without removal, extracted and dried, while still on the spool, thus avoiding the many breaks that will always occur when handling this delicate material in the ordinary ways.

Dyeing in the Yarn Form

The next form of dyeing takes place with yarns, either in skeins, packages or warps. There are still many dyers of yarns who use the old method of dyeing in an open box on sticks and turning by hand. They have a regular routine: three or five turns, then a swing to the other end of the box several times and another series of turns, until the lot has been dyed to shade. Since this method of dyeing involves a high labor cost and is productive of much uneven dyeing as well as giving rise to many lots having poor winding quality, machine dyeing is generally preferred. There are several very different types of skein dyeing machines. One which is quite popular has a large wheel with radial spokes and the yarns are hung on sticks so they run from the circumference to the center. At each slow revolution of the large wheel in the box containing the dye liquor, the lot is submerged and then lifted above the liquor, at which time each set of sticks is given a partial turn, so the lot will not be affected with stick marks. At the end of the operation, the entire wheel is lifted clear of the liquor for unloading. A machine of this type will produce very



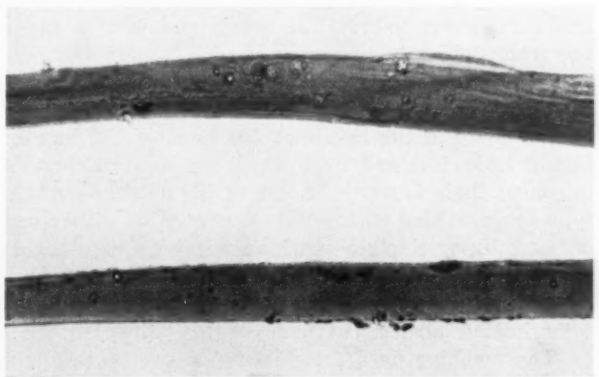
Cross-section of silk fibers (magnification 500 times)

even dyeings on all kinds of yarn and will dye fine cotton, rayon or delicate woolen knitting yarns without matting or tangling. In some districts rayon yarns are even being dyed with vat dyes, despite the great exposure to the air that takes place.

Another very popular type of yarn dyeing machine, which is used mainly for silk and rayons, consists of a series of long spool-like reels which revolve with a planetoid motion, each holding one to two pounds of yarn. The skeins dip into a shallow dye box and revolve constantly. When the lot is finished a large hydraulic jack lifts the entire framework carrying the reels, so the skeins are clear of the liquid. According to the manufacturer, the reels are made of porcelain or hard glass and the color boxes of stainless steel or Monel metal.

A novel type of yarn dyeing machine utilizes a hollow, perforated, cylindrical arm, on which the yarn is hung, but does not touch the dye liquor in the box below. A pump circulates the dye and allows it to cascade through and over the yarn and back into the box. At intervals an arm rotates and turns the skein about one third. There can be a series of these arms in each unit, or smaller units may be cut off from the others to accommodate different sized lots. While there is no reason why such a machine could not be used for cotton, yet its use is principally confined to silk and rayon.

There is a type of yarn dyeing machine which is very popular among dyers of carpet yarns; it is an adaptation of one of the forms which was described for stock dyeing. There is a rectangular box with a false bottom and an end compartment with propellor blades. The yarn is placed on sticks and hung on a rack which lowers to form the top of the box and the liquor is then circulated each way alternately through the lot. The principal advantage of this type of machine is that it is possible to raise the temperature to 210 degrees F. and give certain classes of colors a



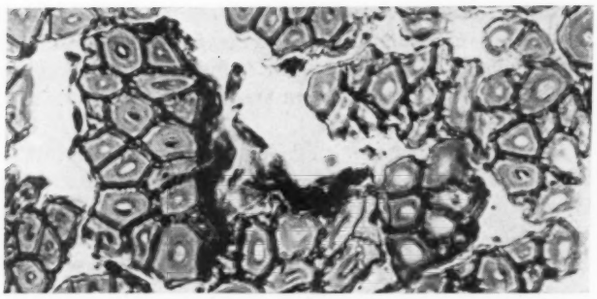
Longitudinal view of silk fibers (magnification 500 times)

long full boil, without unduly matting the yarn.

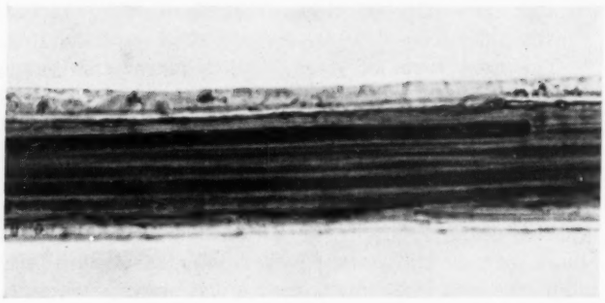
The final development in yarn dyeing is the circulating package dyeing machine, which handles either small carefully wound packages of yarn, or by further adaptations will dye a beamed warp or a jack spool of worsted. Some of these types may also be used for stock dyeing. The regular type forces the dye by pressure through the yarn both ways at regular intervals, while another type draws it through by a vacuum. The dyeing and rinsing are done without opening the machine and then when it is finished, several types have arrangements whereby the carrier may be set over a trap connected with a vacuum and extracted to a high degree of dryness. Yarn dyed in such machines will generally be of uniform color throughout, if proper dyes were used, and will be in condition to form into warps as soon as dry. Good work and increased production demand the use of such dyehouse aids, to meet present competition.

Dyeing of Piece Goods

The next class of materials that must be dyed comprises piece goods. It is an advantage to the manufacturer to go ahead making grey goods and hold them in stock until orders come for some particular color, or else sell to a converter who arranges for dyeing, printing and finishing and sale to the retailer. Piece goods are classed as either woven or knitted. The woven goods fall into two classes; those which may be dyed in rope form and those which must be dyed at full width, to avoid creases and breaks. Wool and worsted goods, as well as soft cotton fabrics are gen-



Cross-section of jute fibers × 500



Longitudinal view of jute fibers × 500

erally dyed in rope form in piece-dye machines. These machines have a section the shape of a quadrant of a circle, with a compartment at the front for steam pipes and for adding color. The goods run over a rail at the front, which has a series of pins to keep the ropes separate; at the back there is a large reel, which may be either circular or elliptical, which causes the goods to pile down in the liquor at the back of the box and slowly slide forward until they are again drawn up to repeat their journey. Some of the machines of this type are provided with guides operated by either compressed air or electricity which will keep a full width piece running in a straight line, in case it is found necessary to dye at full width, as is the case with some heavy fabrics, particularly pile fabrics.

The machine used for silk and rayon piece dyeing differs from the sort used for wool or cotton in that the box is shallower and is a long rectangle in section. There is a compartment for steam and color as before, but instead of the bar and pins we find a small ball bearing reel over which the pieces run; often this is fitted with a stop motion device to prevent a sudden tangle from injuring the pieces. The reel at the back is a larger shallower ellipse, which folds the goods so they gradually float forward in the machine and take up the dye as they are slowly dragged through the dye liquor. Machines made especially for dyeing acetate rayon pieces generally have shorter boxes, but are otherwise the same. Today the best machines are lined and equipped with stainless steel or some equally resistant metal, instead of the cypress or cedar wood which was formerly used. On account of the light nature of silk and rayon goods they are always dyed in rope form in the piece dye machines and if their nature is such that they are likely to break or crease, we must have recourse to jig dyeing, or the star wheel, which is now almost obsolete.

A jig or jigger is a machine designed for dyeing piece goods at full width. There is a fairly small color box equipped with a steam pipe and rolls under which the goods run; at each side is a rubber or pottery beam on which the goods wind and a shifting device which permits of running either way. A roll of goods, say about 500 yards, is wound on one beam and then through the hot liquor and rewound on the other beam. While the temperature of the color box may be near a boil, the dye is mostly taken up mechanically, then while it is on the beam the temperature will be about 150 degrees F. and the dyeing takes place during the time that elapses before it goes through the dye liquor again.

Padding consists in running the goods at full width through a color box supplied from a stock tank and then through a pair of squeeze rolls or nips. In the case of very light goods they simply run through the nips, depending on the lower roll to bring up enough color to saturate the material, but heavier goods must pass through the liquor, or else the color will all be on one side of the goods. Padding is restricted by the solubility of the dyestuffs, yet some materials are now being padded in deep shades, by being run at a boil, sometimes followed by two runs on a jig through boiling strong salt solution to further fix the color.

This summary of fibers and equipment is merely an index; full details concerning every subject are easily obtainable for those who want to study the subject more deeply.

(In the next article, Dr. Pierce will start a discussion of the various types of dyestuffs, their properties and applications—beginning, in Article Three, with The Basic Dyestuffs.—The Editors.)

New Customer Nibbles

A certain textile mill had been trying for some time to get the autocloth business of a large automobile manufacturing company. Finally the automobile company's purchasing agent placed a trial order with the textile mill. It looked like a real opportunity to get in on a sizable volume of business.

Under pressure to get the pieces out speedily, the final finishing overseer and the final inspectors relied upon simple hand methods of testing the tensile strength of the cloth instead of measuring accurately the tensile strength with the testing machine.

The automobile factory, however, took nothing for granted. Very thorough tests to find the tensile strength of the trial pieces were made. They showed that the cloth did not quite come up to specifications. They discovered that the cloth even varied in tensile strength within the same piece.

As the result of their tests they came to the conclusion that this particular textile mill could not be relied upon to deliver a uniform quality of cloth, of the specifications they required. Consequently, no further orders have been placed.

We never know when our entire output or the ability of our entire organization may be judged upon the quality of some single unit of our product, whether an experimental, trial order is being considered or part of our regular deliveries are being tested and examined. We must keep quality high always.

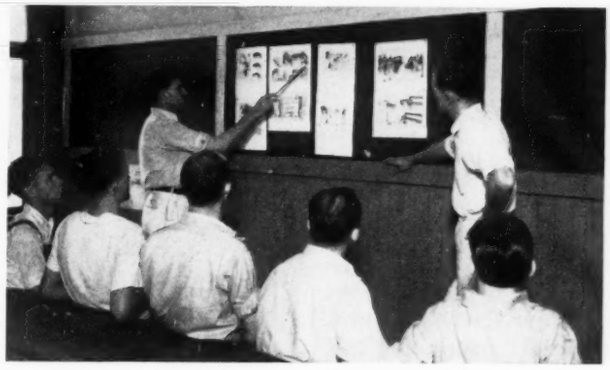
—"Management Information", Elliott Service Co., Inc.

New Trends in Textile Training

By John Middleton

IN THE FALL OF 1937 the writer enrolled as a member of a new kind of textile class in a well-known cotton manufacturing section. For want of a better name it was called the Advanced Textile class, to distinguish it from the evening textile classes and the textile classes in the high schools. This class, or rather classes, for there was a class in three of the communities in this section, was made up of second hands, some of these men being teachers in the evening classes, office men, who wanted to learn more about the inside of the mill, and others with a background of textile training and experience which would make them likely to profit from this advanced type of training.

The teacher or instructor of these classes (we will refer to them in the plural) was a graduate of one of our best-known southern technological colleges. He had practical mill experience in several southern mills and some experience with a merchandising house in New York. He was the type of teacher that inspired his students to prepare their lessons—in fact one just did not like to go to class without having studied the lesson assignment.



The subject matter—well, it is a two-year course, so only about one-half of the ground has been covered—consists of mill processes: opening, picking and cleaning, carding, drawing frames, fly frames, spinning, weaving, designing, fabric analysis and possibly some work in dyeing. While some of the older, standard textile books were used in the main course, the work is built around the very latest text books containing detailed descriptions of the newest developments in textile machinery and processes, in fact some of these books were just off the press. The designing was the same as that done in some of the colleges in the junior and senior years. In addition to this, periodical visits were made into the local mills where some of the newer machines could be observed in actual operation.

The classes were held in three different communities, centrally located, and were for two one-hour periods for each session. The first hour was used for mill processes and the second hour was taken up with designing, but in this connection, however, major emphasis was placed on mill processes, so frequently the designing period was cut short to permit a full discussion of the lesson on mill processes. These classes were held daily for five days a week. Most of the men attended on their own time, that is men on the second shift would attend the morning classes while those on the first shift would go the afternoon classes; however, a few who worked all day would be let off by their employers to attend one of the classes.

A special feature was practice in freehand sketches, at first, by looking at a sketch or a photograph of the machine or part to be sketched, and then, later, sketching from memory. Practically every test included at least one sketch. By this means the students trained themselves to look for details when studying a machine that they would have probably overlooked had they not known that they would likely be called upon to go to the blackboard and make a sketch. In spite of the fact that many of the students protested at first that they "never could draw", we are frank to state that doubtless these same students would attribute the improvement in their grades to their sketches, however poor they may have been.

The bugbear of all textile students is the fly frame, with its compound and concave and convex cones. To illustrate the type of work being done in these classes, this subject was approached somewhat like surf bathing; we stepped first in rather shallow water, waded on out, never turning back, and soon we were swimming and riding the waves as they came in. A poor figure, perhaps, but it illustrates, somewhat, how we were able to understand the workings of this complicated machine, and the calculations incident thereto. To show the progress made in learning the fly frame, many of us were able to calculate the correct diameters of the two cones of the fly frame, at four different positions of the cone belt, this being only one of ten test questions answered during a two-hour period. This is no mean accomplishment, as anyone who has ever studied fly frames well knows, whether the study has been in the classroom of a textile school, or in a mill.

The tests, or examinations, that were given periodically, were very comprehensive. They were as real to the students as any test in high school or college could possibly be. Naturally there were a few students, just as in any other kind of school, who had some kind of idea of getting by without doing any serious studying. Their grades on the first two or three tests awakened them to a realization that if they expected to make passing marks

(Continued on page 94.)

Balanced Twist for Plied Yarns

SOMETIME AGO a correspondent who desired a rule for determining the twist multiple or number of turns to give a well balanced twist for different yarns wrote as follows:

"We have been trying without success to derive a mathematical rule for determining balanced twists for different numbers and plies of warp twist yarn. We have found the following to be fairly well balanced:

	Twist Multiple	Turns Per Inch
2/2 Ply	6	6
8/4 Ply	4.6	6.5
8/8 Ply	4	4
8/16 Ply	3	2.1
8/40 Ply	2.70	1.2
12/12 Ply	3.30	3.30
12/45 Ply	2.90	1.50

"The twist multiple seems to decrease as the single yarn becomes larger. Is there any rule for determining the twist multiple or number of turns to give a well balanced twist?"

We submitted this man's problem to several different mill men, and we believe that the material received in answer to it will prove very interesting and helpful to others.

One correspondent to whom the question was submitted answered as follows:

"In answer to the question recently submitted to me on balanced twist of plied yarns, I would say that due to many possible conditions it is very difficult to give a formula that will suit all conditions.

"The final twist to be balanced depends on the amount inserted at the spinning or in the single yarn; also, the direction of twist of both the spinning and twisting. For instance, if in two-ply yarn one is left twist with a certain amount of twist and the other is right hand twist with another amount, this yarn, to be balanced, would require different turns of twist if twisted right hand in the ply than it would if twisted left hand.

"In addition to this, the size of the single yarn which goes to make the ply and the number of plies affect the twist.

"In this particular case the inquirer states that he finds the following to be fairly well balanced.

Yarn	Twist Multiple	Twist Per Inch
2/2	6	6
8/4	4.6	6.5
8/8	4	4
8/16	3	2.1
8/40	2.7	1.2
12/12	3.3	3.3
12/45	2.9	1.5

"Converting these yarns to the count of singles by dividing the count by the number of plies, for example, 8s/16 = .5s yarn, and making a diagram showing these single counts plotted against the turns per inch (Fig. 1) we can see graphically how the twist runs for the different counts and plies.

"It can be seen from the diagram that the curve for the 8-ply yarn is pretty well defined. The 12s/45 point is also within the curve, but the 12s/12 point is considerably below, indicating perhaps that there should be a separate curve for this yarn. It is possible that the 12s/12 is too low. Probably it should come within the curve to be balanced, or else the 12s/45 is too high, because it is very doubtful that the two curves should cross each other at count ÷ ply = .25. It would be interesting to have several other 12-ply points to see how the curve would compare with the 8s-ply curve. As for the 2s/2 yarn, one point is not enough to determine any curve.

"An approximate formula for the balanced twist of 8s-ply yarn is as follows: First find the resulting count of single yarn by dividing the count by the number of plies. This gives count ÷ ply = resulting count. If this results in an answer of 1 or less, the twist equals (.13 + resulting count) × 3.54. If count ÷ ply or the resulting count, is more than 1 then the twist per inch equals (.57 + resulting count) × 2.54.

"Let us take an example: The twist per inch for 8/40 would be,

$$\frac{8}{40} = .20;\ .20 + .13 = .33;\ .33 \times 3.54 = 1.17$$

turns per inch.

For 8/4 the twist would equal,

$$\frac{8}{4} = 2.00;\ 2.00 + .56 = 2.56;\ 2.56 \times 2.54 =$$

6.5 turns per inch.

"These formulas are not intended for all conditions of 8s-ply yarn as other twist conditions of the same number will require different twists."

Another correspondent to whom we sent the question replied.

"We have found upon investigation of a number of plied yarns of varying twist multiplier in the singles that a reasonable working approximation is: $T = \frac{t}{\sqrt{p}}$, where T equals twist per inch in the plied yarn; t equals the twist per inch in the single yarn; and p equals the number of ply.

"Obviously, this can be written in a more convenient form. This being, $T = c\sqrt{\frac{N}{p}}$, where c equals the twist multiplier for the single yarn, and N equals the counts of the single yarn.

"This formula does not take into account twist contraction fully but gives a value which is a good starting point on which to base machine adjustments. The formula is not based on a sufficiently large number of tests to be universally acceptable, and includes work only up to six-ply. We would, therefore, like to have word from anyone applying it to plied yarns in order to see how it checks up on other combinations.

"It is of course impossible to apply it to the data given in the question submitted to me because of the lack of single yarn twists, and of single twist multiplies."

A third correspondent that we submitted the ques-

tion to had the following to say,

"Replying to the inquiry about twist in plied yarn, will state that we have experimented a great deal with balanced twists in plied yarn for various purposes. We have never found that we could take any given yarn and foretell just how much twist we would have to put in it, even though we know the twist factor of the single yarn.

"You will recall our conversation on the subject of putting twist in yarn by pulling it over the end of the bobbin. When yarn is taken over the butt of the bobbin instead of over the nose, you will find the twist is taken out. Similarly, when single yarn is pulled off the small ends of cones, twist is put in, but, on the other hand, when plied yarn is pulled off the small ends of cones the twist is taken out, because the ply twist is in the opposite direction. Consequently it is necessary to find just where you want the balanced twist to appear. We presume that it should balance when pulled off of the cone, as that is where we have it balanced.

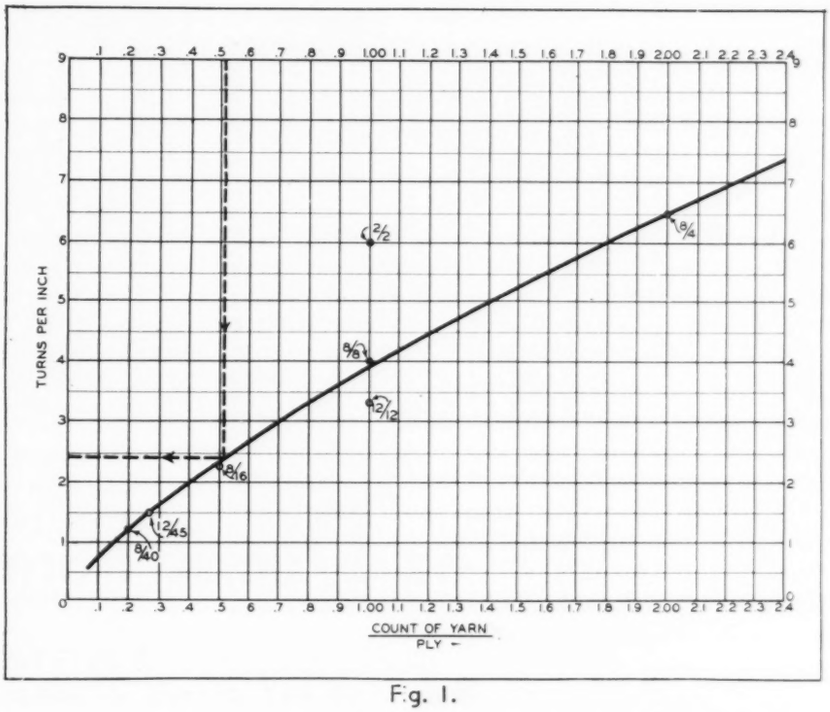


Fig. 1.

"Our method then of determining the proper amount of twist is to first twist the yarn regardless of whether we balance it, so that it will give the best appearance. There is very little difference in appearance whether the twist is balanced or not, but the balanced feature is desirable because it makes the twines easier to handle. After determining the proper amount of twist for appearance, we next change the twist on the spinning frame in order to make it balance on the twister.

"If too much twist appears in your plied yarn to make it balance, simply add twist to your single yarns, and to the contrary if not enough twist appears in your plied yarn, take twist out of your single yarn. Of course, we are limited in the amount of twist that we can take out by the character and length of staple of our cotton, but we are rarely hindered from putting more in up to a reasonable point.

"You understand if a length of twine is doubled and allowed to twist of its own accord, if it has too much twist to balance, the voluntary twist will go in the opposite direction from the twist in the plied yarn. On the other hand, if not enough twist is put in the plied yarn to make it balance, the twist of this double yarn will be in the same direction as the plied yarn.

"It might be interesting to mention here that the writer had considerable complaint at one time from twisted yarn put up in balls, the end being pulled out of the center for use. The complaint was to the effect that the first part pulled out kinked very badly. We simply arranged the end so that it was pulled out from the other side of the ball, and we had no further complaint.

"We are giving you, herewith, some of our twists which I think will show that the twist in the plied yarn depends largely on the twist in the single yarns, and yet varies in no regular way.

"11s yarn spun with 5.24 times the square root is twisted into 3, 4 and 5 ply, with the following respective twist multiples:

3.59 —— 3.63 —— 3.60

"4.80s yarn with a twist multiple of 3.84 is twisted into 6, 8 and 10 ply, with the following respective twist multiples:

3.35 —— 3.23 —— 3.25

"These multiples are possibly as near each other as can be had with the size gears available. In each case the yarn is balanced perfectly. In the case of the 11s, it is balanced as it is pulled off the cones. In the case of the 4.80s, the twine is balanced when pulled from the side of a spool."

A fourth contributor supplied us with the following information:

"I am very glad to receive your recent inquiry and note that your client evidently wishes a standard rule whereby he can arrive at or determine a balanced twist for various numbers of ply yarn.

"In all my experience in making yarns, which covers a good many years, I have never been able to find a definite rule which could be applied in finding a 'balanced' twist. Experience has been the only teacher that I have found, and whenever we have an order for a number which we have never made, we experiment with the twist, using as a guide numbers which we have already made and the twist that gave us the desired results.

"A good way to test a balanced twist is to take the yarn and stretch it to the full length of your two arms, and then let your arms come slowly together. If the yarn does not kink when your two hands reach each other, you will have a very good balanced twist in it.

"We note the twist multipliers which your client uses, and with the exception of a few, they are very

similar to those that we are using; in the 2/2 ply we use a multiple of 5, with 5 turns; in the 8/4 ply we use a multiple of 5 with 7.04 turns; in the 8/40 ply we have 1.2 turns per inch; and in the 12/12 ply we use 3.5 turns per inch. In the other numbers listed our twist is the same as he is using."

Another interesting answer received to this question is:

"I have your recent letter enclosing inquiry as to a definite rule for determining the twist necessary in the ply yarn to produce a balanced twist.

"I believe that it would be absolutely impossible to have any definite rule that would be even close to accurate since there are a multiture of things that would enter into twist and balanced yarn, such as the twist, the weight of raveler and the size of ring in the single yarn and for the ply yarn the size of ring, the type and weight of traveler and whether or not the yarn was twisted on a vertical or flange ring. All of these things, I know would have a bearing on the amount of twist necessary in the ply yarn. Therefore, with this in mind, I say that it would be absolutely impossible to have a definite rule for determining the twist necessary to balance a ply yarn.

"I am sorry that I have no more information than the above to offer and in the event you receive information from other sources on this inquiry, I would be very much interested in it."

The Duerst Formula

For calculating the twist per inch in roving. A theory that has been tried and proven in actual mill practice

SPINNERS HAVE LONG AGO realized that the well-known rule purporting that the twist per inch of counts on roving be proportionate to the square root of the counts will not work satisfactorily for counts that are too far apart. Fine roving hank counts need relatively higher twists than coarse hank counts. This fact has not only been proved in practical mill operations, but a new "twist formula" has been derived, which when applied in the mill, operates satisfactorily. The new formula bears the definite relationship of *twist per inch* and *length* of staple. It is called the "Duerst Formula" after its originator and sponsor.*

But first, an example figuring twist per inch for roving by the accepted rule. For 1 hank roving made of 1-inch American cotton, one turn of twist per inch was inserted and found to be correct. How much twist would 6 hank roving of the same cotton call for? According to the accepted rule, we have:

$$\text{Twist per inch for 6 hank} = \frac{\text{Twist per inch of 1 h.r.} \times \sqrt{6}}{\sqrt{1}}$$

Thus:

$$\frac{1 \times 2.45}{1} = 2.45 \text{ turns per inch required.}$$

From actual experience we know that the calculated turns of 2.45 per inch are not sufficient to make the 6 hank roving of 1-inch staple hold up in the creels of later processes. At least 3 turns per inch must be inserted. To meet the requirements, many mills have made it a practice to calculate a table of twists by using gradually increasing twist multiples. This is a solution to the problem but is not an explanation why the 6 hank roving, for instance, should have a relatively higher twist per inch than the 1 hank roving.

The following accepted formula is correct if the cross section area is considered to be circular in shape:

$$\frac{\text{Twist per inch being inserted}}{\text{Twist to be inserted}} = \frac{\sqrt{\text{counts being made}}}{\sqrt{\text{counts to be made}}}$$

The Duerst Formula

The Duerst formula to be explained in this article considers the number of fibers per cross section, regardless of the shape of the cross section. The Duerst formula for inserting twist in roving reads:

$$\frac{\text{Twist being inserted}}{\text{Twist to be inserted}} = \frac{\sqrt{1 + (8 \times \text{hank count being made})} - 1}{\sqrt{1 + (8 \times \text{hank count to be made})} - 1}$$

Which, when applied to our example for finding the twist to be inserted in 6 hank roving, becomes:

$$\frac{1}{y} = \frac{\sqrt{1 + 8 \times 1} - 1}{\sqrt{1 + 8 \times 6} - 1}$$

$$y = \frac{\sqrt{49} - 1}{\sqrt{9} - 1} = 3.00 \text{ turns per inch for 6 hank roving.}$$

Development of Duerst Twist Formula

As previously indicated, the new formula is based on the number of fibers per cross section, regardless of the shape of the cross section. Consequently, the number of layers around the center of the cross section will be of importance in developing the formula. It would be a cumbersome job to count the layers and more so to count the number of fibers per cross section.

This may be done by calculation as follows: It is reasonable to assume that every new layer of fibers added to the cross section of any fiber-spun yarn or

*John Duerst is connected with the technical department of the Clark Thread Company, Clarkdale, Ga. Mr. Duerst is credited with the principle of the new formula, its derivation, and practical use.

roving will reinforce the inside structure and consequently less twist will be needed if the cross section is increased considerably. Thus, we have the following natural conclusion:

The number of fibers per roving cross section are inversely proportional to the amount of twist needed.

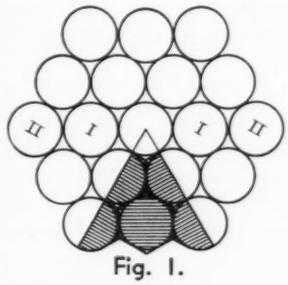


Fig. 1.

Suppose we have two roving cross sections, "A" and "a". The area of each is proportional to the number of fibers in each. Now the number of fibers in any circular cross section may be calculated with the use of arithmetical progressions as follows: If "N" indicates the number of layers around the center, the total number of fibers to the entire cross section will be:

$$\text{Number of fibers} = \frac{6N\ (N + 1)}{2} + \text{Center unit}$$
$$= 3N\ (N + 1) + \text{Center Unit}$$

Looking at Fig. 1, I is the first layer and II is the second layer. At round or hexagonal unit cross sections the sum of all unit cross sections is:

$$S = \frac{6N\ (N + 1)}{2} + \text{Center unit}$$

If N equals 2, then S equals 19 units. The cross section of a cotton fiber is not round but rather triangular or rectangular. In other words, there is a rather irregular arrangement of unit cross sections within a full cross section. This being the case, we can easily assume the center unit to be an imaginary one and therefore not consider a center unit for further calculation. The total units per cross section will then be:

$$S = 3N\ (N + 1)$$

or, if the number of layers for the first cross section be N and for the smaller cross section be n layers, the proportion will read:

$$\frac{\text{Total number of fibers in A}}{\text{Total number of fibers in a}} = \frac{3N\ (N + 1)}{3n\ (n + 1)}$$

Now, since the number of fibers per cross section is inversely proportional to the required twist volume, we can arrange the following set-up if T be the required twist for N layers and t be the required twist for n layers:

$$\frac{3N\ (N + 1)}{3n\ (n + 1)} = \frac{3t\ (t + 1)}{3T\ (T + 1)}$$

and again, since the number of fibers in cross section A and a are also inversely proportionate to their hank counts H and h, we have:

$$\frac{3N\ (N + 1)}{3n\ (n + 1)} = \frac{h}{H} = \frac{3t\ (t + 1)}{3T\ (T + 1)}$$

$$\frac{h}{H} = \frac{t\ (t + 1)}{T\ (T + 1)}$$

and further, if the value of H be 1 hank and if the value of T be 1 turn per inch, we have:

TABLE OF ROVING TWISTS

Calculated According to Duerst's Formula

Twist per inch = .36 (2.39 — S) ($\sqrt{1 + 8h}$ — 1) of which S = length of staple in inches and decimal inches and h = hank counts.

Cotton Staple — Staple (S)	A	B	C	D	E	F	G	H	I	J	K
	7/8"	15/16"	1"	1 1/16"	1 1/8"	1 3/16"	1 1/4"	1 5/16"	1 3/8"	1 7/16"	1 1/2"
	.875	.9375	1.00	1.0625	1.125	1.1875	1.250	1.3125	1.375	1.4375	1.50
Multiple (M)	.545	.5225	.500	.4775	.455	.4325	.410	.3875	.365	.3425	.320
Hank Cts. (h)	Turns per Inch										
.50	.676	.648	.620	.592	.564	.536	.508	.481	.453	.425	.397
.75	.894	.857	.820	.783	.746	.709	.672	.636	.598	.562	.525
1.00	1.09	1.05	1.00	.955	.910	.865	.820	.775	.730	.685	.640
1.50	1.42	1.36	1.30	1.24	1.18	1.13	1.07	1.01	.949	.891	.832
2.00	1.70	1.63	1.56	1.49	1.42	1.35	1.28	1.21	1.14	1.07	.998
2.50	1.95	1.87	1.79	1.70	1.62	1.54	1.46	1.38	1.30	1.22	1.14
3.00	2.18	2.09	2.00	1.91	1.82	1.73	1.64	1.55	1.46	1.37	1.28
3.50	2.39	2.29	2.19	2.09	1.99	1.89	1.80	1.70	1.60	1.50	1.40
4.00	2.58	2.48	2.37	2.26	2.16	2.05	1.94	1.84	1.73	1.62	1.52
4.50	2.76	2.65	2.54	2.42	2.31	2.19	2.08	1.97	1.85	1.74	1.62
5.00	2.94	2.82	2.70	2.58	2.46	2.34	2.21	2.09	1.97	1.85	1.73
5.50	3.11	2.98	2.86	2.73	2.60	2.47	2.34	2.21	2.08	1.96	1.83
6.00	3.27	3.14	3.00	2.87	2.73	2.60	2.46	2.33	2.19	2.06	1.92
6.50	3.42	3.28	3.14	3.00	2.86	2.72	2.58	2.43	2.29	2.15	2.01
7.00	3.57	3.42	3.28	3.13	2.98	2.83	2.69	2.54	2.39	2.24	2.10
7.50	3.71	3.56	3.41	3.25	3.10	2.95	2.79	2.64	2.49	2.33	2.18
8.00	3.85	3.69	3.53	3.37	3.21	3.05	2.90	2.74	2.58	2.42	2.26
8.50	3.98	3.82	3.66	3.49	3.33	3.16	3.00	2.83	2.67	2.50	2.34
9.00	4.11	3.94	3.77	3.60	3.43	3.26	3.09	2.92	2.75	2.58	2.41
9.50	4.23	4.06	3.89	3.71	3.54	3.36	3.19	3.01	2.84	2.66	2.49
10.00	4.36	4.18	4.00	3.82	3.64	3.46	3.28	3.10	2.92	2.74	2.56

Should, for example, 1¼-inch cotton (G) be somewhat minor in length and the roving show too many creel breaks, it be necessary to use the twists marked in column (F), or, if the cotton would show improved qualities, take twists under letter H.

While the columns from A to B to C, etc., might thus be arbitrary and changed to suit local conditions, the proportionalities of the vertical figures must stay intact.

For many mills the twists per inch in the table might look on the low side according to the staple length indicated on the heads of the columns, especially if uncombed roving hanks are made.

$$h = \frac{t\ (t + 1)}{2}$$

$$t = \frac{\sqrt{1 + 8h} - 1}{2}$$

This latter formula happens to give correct twists per inch for all roving hank counts made of 1-inch staple. While this is entirely coincidental, this fact comes in handy for calculation. All other staples need in addition a coefficient which embodies relationships between twist and length.

Twist per inch for all roving hank counts

$$t = \left(\frac{\sqrt{1 + 8h} - 1}{2} \right) \times M$$

A formula for the coefficient M has been established by Mr. Duerst through calculations based on actual performance and came out to be:

$$M = .72\ (2.39 - S)$$

of which S is for staple length in inches and decimal inches. So the final twist formula will read, if staple length and hank units are known:

$$\text{Twist per inch in roving} = .36\ (2.39 - S) \times (\sqrt{1 + 8h} - 1)$$

From this formula ready tables may be calculated and kept within reach for reference. These tables for various lengths of staple are shown herewith. The only deviation from these tables over a 4-year period has been when a certain crop was shorter than the previous crop, or when some hanks showed a trifle too little twist, in which cases was chosen the twist of the shorter cotton on the table.

Weaving Duck

With especial emphasis on preventing baggy and crooked fabric.

WEAVING DUCK is often considered by some to be a simple operation. The weaves usually are plain, requiring no complicated looms and attachments, as in the case of fancy weaves. For years duck has been made almost exclusively on plain looms, but more recently many constructions are now being woven on automatic bobbin changing or shuttle changing looms. However, the requirements of the users of duck are very strict, so that the weaving of duck is not the "snap" that some might think it to be.

For certain purposes duck must lie perfectly flat and straight, with equal tension on each selvage. The gauge or thickness must be uniform. The width must be correct within very small tolerances. The warp and filling count and the weight must be up to exacting standards. For these reasons the weaving of duck has become a science. Careful supervision of every process from the time the bale of cotton is opened until the covering is on the roll of duck is absolutely necessary.

When a mill is troubled with baggy and crooked duck, and bad selvages, there are a number of things that might be checked over as possible causes of these troubles. Of course, it is more likely that these defects will occur in hard-woven constructions, and immediately one might surmise that slippage and unequal tension are the contributing causes. However, it is well to go over the beaming department to start checking, especially if the crooked duck seems to be general. If only a few rolls are bad, keep a check on the loom numbers from which these rolls come and soon a finger can be put on the trouble. Assuming that the complaint is general, check over the beamers, being sure that the rolls are properly lined and leveled, and that the tension rolls and the delivery roll are square with each other. See that the arms that support the press roll are level. The press rolls should be kept in good shape with good spring heads, and with pins always run in the false heads to keep the false heads from sagging. Some weavers prefer to have the selvages of their warps run a little higher than the body of the warp.

The looms should be checked over and all essential parts lined and leveled. Especial attention should be given the harness, the whiproll, the lay, the reed, the breast beam (on C & K looms), the take-up rolls, and the roll on which the cloth is wound. Check the crank arms to be sure that they are both the same length. One can readily see what one crank arm a little longer than the other might do to the cloth. Some mills are using crepe rubber with which to cover the take-up rolls, and even the sandrolls on automatic looms, to help overcome the slippage that is such a contributing factor in making crooked cloth.

Rolls of duck lying on the floor in the cloth room for some length of time before being run and covered might have a tendency to absorb humidity at each end, for a short distance, but if the rolls are tightly wound the humidity will not likely penetrate throughout the roll. This might cause the selvages to be somewhat tight when unwound. It is not likely that this will often be the cause of tight selvages, but it is well not to overlook this factor as being a possible cause.

This question of baggy and crooked duck can cause the weaver a lot of headaches. Sometimes a loom will make one roll of good duck, then the next will be crooked and possibly baggy, then maybe the roll that comes off next will be good. The suggestions we have outlined have been practiced with a fair degree of success.

Sometimes a piece of duck is required with a minimum of stretch. Some recommend starting in the twisting room and running the yarn for this fabric with as heavy a traveler as possible. Then putting all the weight on the beamers that the yarn will stand. When the beam is put in the beamer, check the heads to be sure that they are tight. On the loom put all the tension on the warp that the yarn will stand.

There is a question in the minds of some as to the position of the whiproll in relation to the breast beam as concerns shrinkage. Our view is that this affects the face of the cloth, but we cannot see how it affects the shrinkage.

Textile Chemists and Colorists Hold Successful Meeting in Atlanta

Alban Eavenson, of Philadelphia, president of AATCC, being greeted by Robert W. Philip, chairman of the southeastern section, upon his arrival, with Mrs. Eavenson, for the national convention. Left to right: Mr. Philip, Mrs. Eavenson, Mr. Eavenson, Mrs. James Ivey White, chairman of the ladies' entertainment committee, and Louis A. Olney, of Lowell, Mass., president-emeritus of the association . . . . . .

THE American Association of Textile Chemists and Colorists went South once more for its 18th annual convention, held December 2 and 3 at the Atlanta Biltmore Hotel, Atlanta, Ga., under the auspices of the southeastern section. A full program of entertainment, provided by the host section, and the customarily excellent technical sessions under the direction of Carl Z. Draves comprised the affair, which drew an especially large attendance from other parts of the country as well as from the southern sections. There was a total of 468 registrations, with larger numbers in attendance at the social functions.

Alban Eavenson, chairman of the board, Eavenson & Levering, Camden, N. J., president of the Association, presided at the association's functions. By letter ballot, Mr. Eavenson was re-elected president for 1939, and the other officers were re-named, including Duncan Ferguson, of Shelton, Conn., and Arthur R. Thompson, Jr., Charlotte, N. C., vice-presidents; and William R. Moorhouse, Boston, treasurer. Harold C. Chapin, secretary, and Louis A. Olney, chairman of the research committee, were returned to these posts by the council.

Chronologically, the convention was opened with a luncheon on Friday, December 2, with Allen Jones, vice-chairman of the southeastern section, presiding. Theo. M. Forbes, executive secretary, Cotton Manufacturers Association of Georgia, presented Dr. M. L. Brittain, president of the Georgia School of Technology, Atlanta, who welcomed the visitors. Hugh M. Comer, vice-president and general manager, Avondale Mills, Sylacauga, Ala., was the feature speaker, discussing in a humorous and striking manner "A Mill Executive's Viewpoint of Dyeing and Finishing." Music for this occasion was furnished by an orchestra from the Avondale Mills plant at Sycamore, Ala., under direction of Harmon Mims. There were 317 members and guests at this luncheon.

Simultaneously, the southeastern section tendered a luncheon for the ladies, with 63 ladies present. This luncheon, and the bridge party which followed, was under the direction of Mrs. James Ivey White of Atlanta.

For the technical program, the council acceeded to a request from the southeastern section to depart from the custom of devoting the entire day on Saturday to this purpose, and, for the first time, divided the technical program into two sessions, one on Friday afternoon and one on Saturday morning. Five technical papers were presented on Friday afternoon, and six papers on Saturday morning. A well-qualified and prominent delegate, who attended both technical sessions in their entirety, has prepared for COTTON a digest of the technical papers and discussion, which will be found further in this report.

On Friday evening, delegates and their ladies were entertained by the southeastern section at a typical southern barbecue, with entertainment furnished by Graham H. Jackson, talented negro pianist, and a troupe of southern negro entertainers. The Avondale Mills' moving picture, "Destiny of Dixie", depicting working and living conditions in a typical southern textile mill community, was shown on Friday evening. After the entertainment there was a informal dance. This function was under the supervision of P. G. Wear, chairman of the local entertainment committee. There were 490 delegates and their ladies at the Friday supper.

Saturday noon, a luncheon of officers of the sections of the association, proposed by Past-President W. H. Cady, was held, with an attendance of 33, and as a result of the thoroughly helpful and stimulating results of the informal discussion there on problems of section operation, those present unanimously voted to request that this meeting be made a regular feature of subsequent annual conventions.

Saturday afternoon was devoted to sight-seeing trips and an association golf tournament. The scheduled sight-seeing trip included a visit to the famed Cyclorama, a painting of the Battle of Atlanta during the War Between the States, and other points of interest in the city. The golf tournament, under the direction of Russell Gill, was played on the courses of East Lake Country Club and Brookhaven Country Club.

The final function of the convention was the annual banquet, held at the Atlanta Athletic Club, under the auspices of the southeastern section. The banquet, preceded by a reception, was followed by a formal dance. At the banquet, Vice-President Arthur R. Thompson, Jr., presented to Past-Presidents Louis A. Olney, Robert E. Rose, Elvin H. Kilheffer, P. J. Wood, and William H. Cady, diamond studded service pins on behalf of the Association. President Alban Eavenson spoke briefly with reference to the research work of The Textile Foundation. The feature speaker was Hon. Walter F. George, senior U. S. Senator from Georgia, who discussed national problems. Senator George was introduced by Scott Russell, executive vice-president of the Bibb Mfg. Company, Macon, Ga., and a number of southern mill executives attended this function. Music was furnished by the Georgia Tech Glee Club and Harry Hearn's orchestra. Awarding of golf, bridge and attendance prizes was made at the banquet. There were 644 present. Robert W. Philip, chairman of the southeastern section, was toastmaster.

An interesting adjunct to the convention was an exhibit of southern-made textile products, in the ball room and foyer of the hotel. These displayed demonstrated the variety and quality of southern made products. Among the participating companies were:

Tennessee Eastman Corp., Kingsport, Tenn.; Tubize Chatillon Corp., Rome, Ga.; North American Rayon Corp., Elizabethton, Tenn.; Fulton Bag & Cotton Mills, Atlanta, Ga.; Callaway Mills, LaGrange, Ga.; Spalding Knitting Mills, Griffin, Ga.; Thomaston (Ga.) Cotton Mills; Canton (Ga.) Cotton Mills; Newnan (Ga.) Cotton Mills; E-Z Mills of Georgia, Cartersville, Ga.; Pepperton Cotton Mills, Jackson, Ga.; Eagle & Phenix Mills, Columbus, Ga.; Sibley-Enterprise Mills, Augusta, Ga.; Atlanta (Ga.) Woolen Mills; Swift Mfg. Co., Columbus, Ga.; Lanett Bleachery & Dye Works, West Point, Ga.; Pepperell Mfg. Co., Lindale, Ga.; Muscogee Mfg. Co., Columbus, Ga.; Georgia-Kincaid Mills, Griffin, Ga.; Bibb Mfg. Co., Macon, Ga.; Clark Thread Co., Clarkdale, Ga.; C. M. Jones Company, Calhoun, Ga.

In addition to these exhibits, there was an attractive display from the Martha Berry Schools, of Rome, Ga., which included students in colonial costume operating hand-spinning wheels and looms.

A number of southern textile mills contributed products which were awarded as bridge, attendance and golf prizes during the convention. These companies included:

Vann-Moore Mills, Franklinton, N. C.; Georgia Kincaid Mills, Griffin, Ga.; Union Bleachery, Greenville, S. C.; Bibb Mfg. Co., Macon, Ga.; Callaway Mills, LaGrange, Ga.; Tubize-Chatillon Corp., Rome, Ga.; Gossett Mills, Anderson, S. C.; Muscogee Mfg. Co., Columbus, Ga.; C. M. Jones & Co., Calhoun, Ga.; Thomaston Bleachery, Thomaston, Ga.; Oconee Textile Co., White Hall, Ga.; Crystal Springs Bleachery, Chickamauga, Ga.; Cabin Crafts, Inc., Dalton, Ga.; Archer Hosiery Mills, Columbus, Ga.; and Pepperell Mfg. Co., Opelika, Ala.

Report of AATCC Technical Papers and Discussions

(The following report of the technical sessions at the Atlanta convention of AATCC was prepared exclusively for COTTON *by a textile executive who is eminently qualified to digest the technical papers, and who attended both sessions. His comments, in his own words, are presented as a brief summary of an extensive group of technical discussions.)*

The papers presented at the meetings fall into two general groups: (1) those of a general character and (2) those dealing with specific technical problems. In the first class were the papers of Dr. Harris, Dr. Macormac, Mr. Worthington, Mr. Stallings and Professor Grimshaw. In the second class were the papers of Mr. Adams, Dr. Draves, Mr. Williams, Mr. Smith, Mr. Green, and Mr. Young.

Dr. Harris' paper[1] was a concise statement of the work in progress at the National Bureau of Standards under the auspices of The Textile Foundation. This consists of a strictly technical study of the acidic and basic properties of the cotton, wool and silk fiber, together with the effect of oxidizing and reducing agents on the properties of the fibers. No results of the present condition of the studies were given, but the statement was made that there would be a determined effort made to correlate the technical results of this work, when completed, with practical mill operating conditions, so that the money the industry has spent on the studies can be put back to work and not simply filed away as objects of chemical and physical curiosity. There was no discussion of this paper.

Dr. Macormac's paper[2] stated that there seemed little possibility of greatly extending the use of cotton fiber along the traditional lines of textile manufacture. Further extension of the use of the fiber must come from such treatment of the fiber, either chemically or physically or both, as would result in greater strength of the fiber, or in such changes in its appearance and properties as to make it a closer competitor with rayon, wool, linen and silk. This may come from use of the treated cotton fiber by itself, or by such combination with the other textile fibers as will produce cloth of new appearance and properties. There are also opportunities for increased use of the by-products of the cotton plant, such as seed, stalk and shell. Up to this time there has been little development of these by-products save in the case of the seed. There are possibilities for the increase in the use of the oil as a source of solid fats. However, the greatest chance for increased consumption of cotton at present lies in its becoming a cheap source for the various types of cellulose pulps and regenerated cellulose products. No specific examples of changes in cotton character were presented. There was no discussion of this paper.

Mr. Worthington's paper[3] was a review of the chemical and physical structure of flax fiber, and of the European methods in use for processing the material. Up to this time almost all of the flax used in textiles in this country has been imported. In view of the possibility of cutting off of these supplies in case of European war, and in view of the need of crop diversification in sections of this country where flax can be grown, the TVA, in conjunction with the Georgia State Experiment Stations, has been conducting studies along the lines of flax fiber production in the South.

As a result of these studies a method of producing the fiber from the plant has been developed, which is the opposite, mechanically, of the European methods, and the resulting fiber has been advantageously employed to improve the strength and spinning properties of cotton and rayon when mixed with them, as well as to give an improved appearance to the resulting mixtures. Such mixes have been spun into towels, summer suiting and unholstery. The success of the fiber, as developed in this country, depends upon the ability to produce and process it at costs that will make it competitive with existing textile fibers; this

(1) The Research Program of the Textile Foundation at the National Bureau of Standards, by Milton Harris, director of research for Textile Foundation Research Associateship.

(2) "Methods for Increasing the Consumption of Cotton", by A. R. Macormac and C. A. Basore, of Alabama Polytechnic Institute.

(3) "Flax—its Agricultural and Industrial Possibilities", by C. G. Worthington, research fellow at the State Engineering Experiment Station, Atlanta, Ga.

point has not been reached. There was no discussion of this paper.

Professor Grimshaw's paper[4] was a discussion in very general terms of the difficulties that textile schools have in fitting men into the jobs that they seem temperamentally best fitted for, and the hardship that the graduates undergo when they first step into the industry, owing to the lack of practical experience, especially in the handling of men, and, second, in handling manufacturing processes. The main point of the paper seemed to be the desire of the schools to make a decided attempt to study the experiences of the recent graduates as a means of making such changes in the undergraduate study as would render them less theoretical and more closely related to actual industrial practice. There was no discussion of this paper.

Mr. Stalling's paper[5] was mainly a review of the literature of the chemical and physical properties of the various starches and their modifications, together with a general statement of the physical properties that each variety of starch and starch gum imparts to the various fibers processed with it. There was no discussion of this paper.

Adams on Textile Testing

Mr. Adams' paper[6] was a discussion of the value of laboratory testing of textile materials from the raw cotton to the finished cloth as a means of controlling strength and appearance of the finished fabric and of maintaining uniform and economical processing of the fiber throughout all operations. The human element was stressed as being the most important in such testing, as it is the basis of the interpretation of all results that are obtained from the mechanical equipment, which was thereby translated from numerical terms into terms of efficiency and economy in manufacturing processes.

The mechanical equipment of a laboratory must be of the best, and must be maintained at top efficiency if the results are to render their proper value when used as guides to manufacturing processes. The importance of uniform and standard conditions of humidity and temperature in testing was stressed, as it is only when work is done under these conditions that the results from day to day and week to week have comparative value. In this connection, the speaker grouped the mill laboratories into three classes: Class I included those laboratories that have, in addition to standard and well maintained apparatus, both temperature and humidity under accurate control; in other words, operating under air-conditioned conditions. Class II consisted of laboratories with first-class mechanical and human equipment, but with accurate control of humidity conditions only. Class III consisted of laboratories of good mechanical and human equipment, but lacking all control of temperature and humidity, these varying with outside climatic conditions.

Absolutely accurate, and at all times comparable, results should be obtained from Class I laboratories. Class II laboratories should give practically as good results as the Class I laboratories since, save in the South in summer-time, temperatures can be manually controlled to within the limits set for temperature variations by the A.S.T.M. specifications. The results obtained from Class III laboratories are at best but approximations of those obtained under standard conditions, and are of value only as the ones using the results can correlate them with the physical conditions existing at the time of testing.

Considerable discussion followed this paper, dealing mainly with the types of apparatus best adapted to particular operations. In the case of abrasion testing, it was of interest to note that the speaker stated that there was not enough uniformity in the work of the various types of such machines as to permit of any comparison of results by different workers, but that comparative results obtained by the same operator, with the same technique and on the same machine, are of value in determining wearing qualities.

Dr. Draves gave an interesting paper comparing the AATCC official method of evaluating wetting agents with the new canvas disc method.[7] The author illustrated the actual test operations of the two methods, and plotted curves for evaluation by them. It appeared that the Draves method gives more accurate results with dilute mixtures and that the canvas disc method might be more accurate with stronger solutions. In view of this it seemed advisable to re-study the official method along side of the newer method, and possibly include some modification of the canvas disc method for solutions out of the range of the Draves method.

Naphthol Dyeing, by Williams

Mr. Williams' paper on naphthol dyeing of cotton piece goods[8] was a detailed discussion of the mechanical construction of the pad; the methods of feeding pad liquors; the proper methods of setting and maintaining even pressure on the rolls; the proper types of dryers and speeds of cylinders; the selection of evenly exhausting naphthols for combination shade work; the development of the naphtholated yards; its after treatment in the water and soap and alkali boxes; and the final drying of the yarn in the hot air flue. The paper was so clear in its detail of every step that subsequent discussion was unnecessary. Its object was to show that the general principles of naphthol dyeing are thoroughly established and that further advance must be along the lines of refinements of machines and operating methods. The combination of suitable color combinations with the most up-to-date machinery enables production of dyeings that are far

(Continued on page 65.)

(4) "Your Student Section at N. C. State College and its Prob'ems", by Albert H. Grimshaw.
(5) "The Ro'e of Starch in Textiles", by James W. Stallings, of Stein Hall & Co.
(6) "The Testing of Textile Fabrics", by R. H. Adams, consultant, Callaway Mills.

(7) "The AATCC Official Method for the Evaluation of Wetting Agents", by Carl Z. Draves, Ludlow Mfg. & Sales Co.
(8) "The Dyeing of Naphthols on Cotton Piece Goods by the Continuous Hot Flue Method", by Sumner H. Williams, General Dyestuff Corp.

Prize Winners at Atlanta Convention

AT THE luncheon and bridge party for ladies at the AATCC convention in Atlanta on December 2, Mrs. Max Parker, of Kingsport, Tenn., won a dress pattern of pink rayon material, from Union Bleachery, Greenville, S. C.; Mrs. Irving J. Royce, of Charlotte, N. C., won second prize, a package towel set from Muscogee Mfg. Co., Columbus, Ga.; Mrs. Royce C. Smith, of Columbus, Ga., for low score, won a chenille bath-room set from Callaway Mills, LaGrange, Ga. Mrs. J. M. Youngblood, of LaGrange, as first cut prize winner, received a dress pattern of teal blue rayon challis, from Tubize-Chatillon Corp., Rome, Ga., and Mrs. Carl Hartrampf, of Columbus, won second prize, three pairs of full-fashioned hosiery from Archer Hosiery Mills, Columbus.

In the golf tournament on Saturday, Milton Harris, of Washington, won the silver loving cup, presented by the southeastern section, for low gross score. He shot an 80 on the Brookhaven course. R. A. Field, Jr., Newnan, Ga., won a zipper bag, and Henry Herrmann, of New York, won a rain jacket, these being contributed by the southeastern section; and George H. Small, of Atlanta, won a golf suit contributed by Callaway Mills. Robert T. Lindsey, Alexander City, Ala., won a pair of denim overalls contributed by Canton (Ga.) Cotton Mills for high score in the golf tournament. These prizes were awarded at the banquet by Charlie Yates, of Atlanta, British amateur golf champion.

The Why and Wherefore of FABRIC DESIGNING

By T. O. Ott, Jr.

(Article 6)

THIS constitutes the sixth installment of a series on designing written especially for COTTON by Mr. Ott. The series covers the fundamental principles of designing and in no way attempts to release specialty fabrics for production purposes. Studied in this article are combinations of simple weaves to give varied effects . . . . . .

Combination of Simple Weaves

To understand fully the enormous possibilities of the most fundamental weave structures, the beginner should gain some proficiency in combining two or more simple basic weaves. So many of the most effective fabrics are obtained from such combination of basic weaves and the judicious selection of yarns, color and construction. Since we have made a study of basic weaves and constructions and yarns in the foregoing articles, this is the most logical time for the study of weave combination.

The reader may find it profitable to re-read each of the foregoing articles in the series before going farther into this work. This study in weave combination will be helpful in many ways, especially in analyzing fabric samples; however, the most decided advantage in doing such work is to create originality and interest in fancy weave structures. No two people would combine weaves alike even given the same basic weaves to work with and the same objective to work to. Therein lies the very essence of the creation of good and interesting design.

The chief difference in the stylist and the designer as ordinarily compared is in the ability of the two individuals to secure the interesting designs or suggestions that sell. This is of course the difference between the master and the copyist or student. Only broad experience, broad contacts, and a thorough knowledge of the mechanics of designing and weaving can develop a designer into a stylist.

So far we have studied three very broad classifications of basic weaves, viz.: the plain weave, the twill weave, and the satin weave—and some of their combinations. Now for some specific studies in making some interesting combinations with these tools to work with and with definite objectives in view.

Combination of the Plain Weave with the Twill Weave

Here we begin with Fig. 1 the plain weave and Fig. 2 the 45 degree 3 up 3 down twill with the object in view of obtaining an interesting fancy weave from a combination of the two weaves. Since the plain weave is on two harness and the twill weave is on six harness the combination of the two weaves may change the drafting. This may be determined by comparing the multiples of the figure representing the number of harness and noting if one is a multiple of the other. In this case 2 is a multiple of 6 so the combination weave may be worked out on 6 harness. We will note this factor in making our combinations so that the beginner may be consistent in making weave combinations.

Now that we have selected the two weaves to combine supposed we examine them carefully to see their possibilities in combination. Looking at the 3 up 3 down twill we see two possible combinations with the plain weave, viz.: First, substituting a twill line consisting of a plain weave for the twill line represented by the raisers of the 3/3 twill and second, substitution of twill line consisting of a plain weave for the twill line represented by the sinkers of the 3/3 twill. These two combinations are shown in Fig. 3 and Fig. 4 respectively.

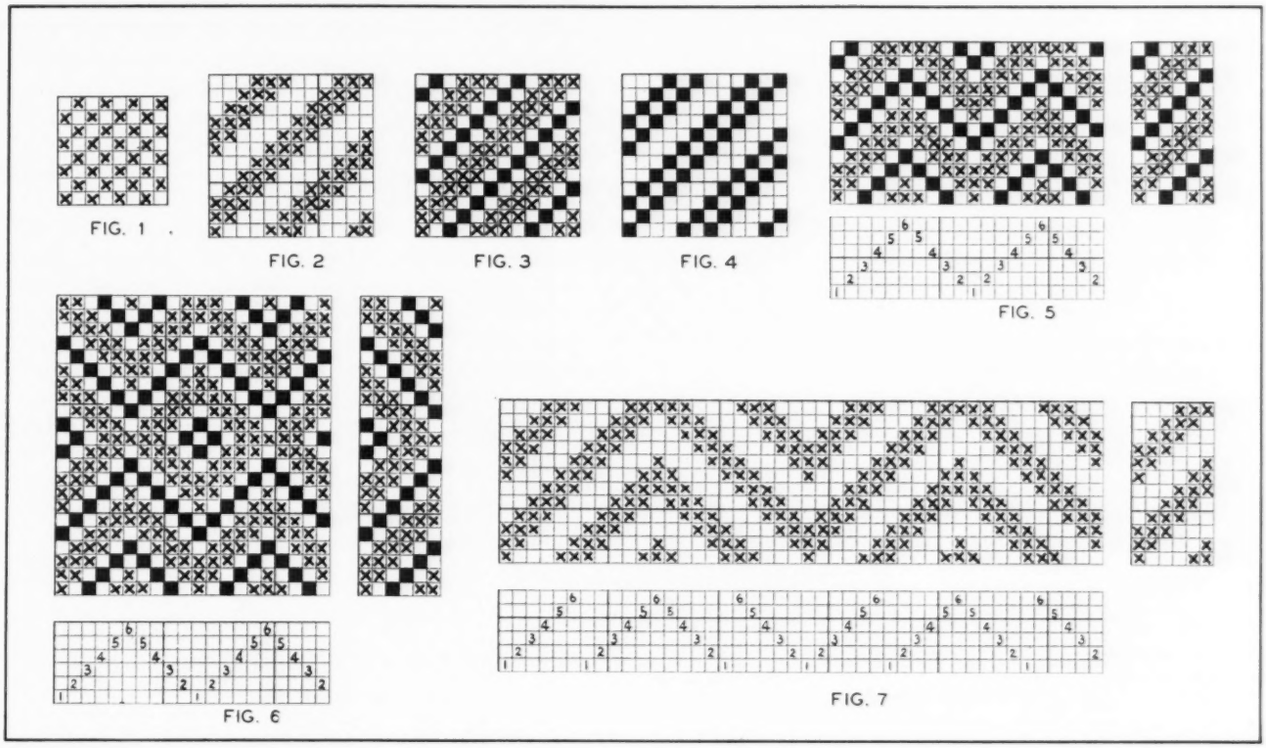
In following this line of reasoning we would possibly all reach the same result as this particular combination of two weaves will be limited as shown. Only when we introduce a third factor, drafting, or a fourth factor, reversing of the chain draft, will we begin to diverge. This is assuming we have the same yarns and construction to deal with because differences here will give us unlimited variations.

Here let us illustrate the result of changing the drawing-in draft by a simple example of reversing the draft to make a point or herringbone effect. The design shown in Fig. 3 is represented in Fig. 5 with the point draft effect used.

The other possibility mentioned would be the reversal of the weave in a vertical direction or in other words the reversal of the chain draft of the design. Some very interesting effects are obtained on a few harness by this method with the twill weaves. Such a figure derived from the weave in Fig. 5 is shown in Fig. 6.

Another effective way in which to work out an

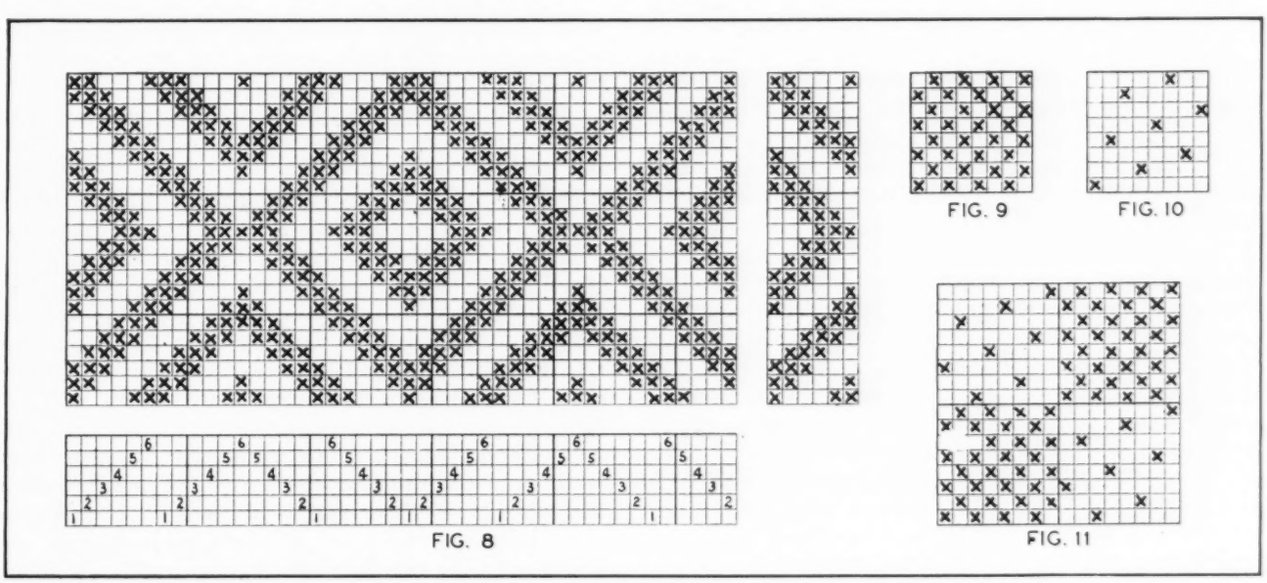
The first article appeared on page 56 of the January 1938 issue and covered the scope of the designer and the sample in process for which there is no original sample; the second article appeared on page 64 of the March issue and took up the essential steps in reproducing a sample fabric and in calculating cost of production; the third article, on page 55 of the June issue, was devoted to a study of the basic weaves, their classification and uses in different fabrics; the fourth installment on page 55 of the July issue gave a complete study of fabrics as to construction, texture, weave, and design; the fifth article on page 65 of the September issue covered yarns, their analysis, and construction for plain or fancy cotton goods mills.



interesting design using a very simple twill weave to start with is to use a double pointed draft pointed in two directions for six harness. Referring to Fig. 2 as a basis we mark in a design for two repeats from left to right then reverse the draw and make the weave for two repeats from right to left. The resulting design, drawing-in draft and chain draft are shown in Fig. 7.

Other good effects may be obtained by compounding the chain draft instead of the drawing-in draft which merely means painting in two or more repeats of chain draft before reversing the weave. We are illustrating in Fig. 8 an example of a weave derived from Fig. 2 using a combination of compound drawing-in draft and chain draft.

With combinations of the plain weave and the satin weave some little ingenuity is required in making the selection of the satin weave to use in the combination and in changing from one weave to the other without causing a bad union or break. Usually a satin weave on an even number of harness is better suited for combination with the 2 harness plain weave than one on an odd number of harness. However, combinations of even and odd harness weaves are practical if the weave is repeated correctly. Inasmuch as the satin weave and the plain weave are so distinctly different some very pleasing effects are obtained such as plain and satin checkerboard weaves and barred effects where two fillings may be used very effectively on a box loom.



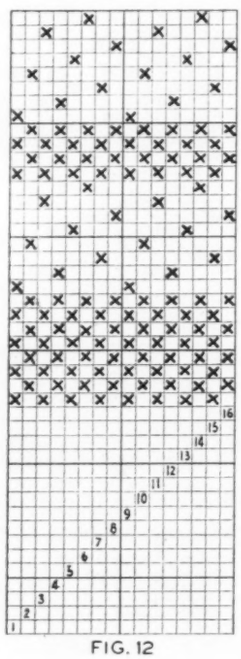


FIG. 12

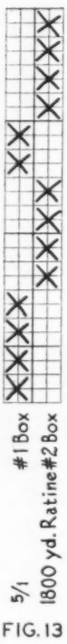


FIG. 13

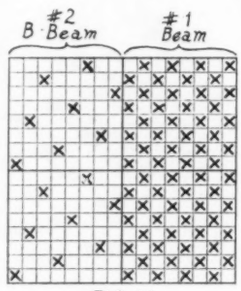


FIG. 14

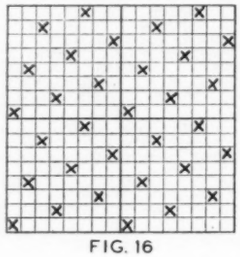


FIG. 16

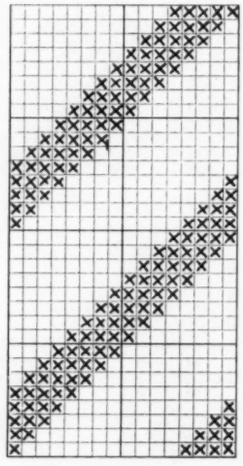


FIG. 15

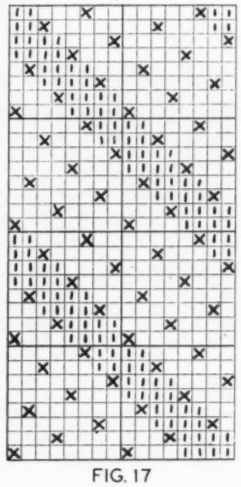


FIG. 17

We will begin our study here with the two basic weaves of our selection, viz., the plain weave and the 8-harness satin weave with 3 as a counter. These weaves are shown as Fig. 9 and Fig. 10 respectively.

First we will combine these two simple weaves in a checkerboard effect showing two repeats of each weave. This pattern would be woven on 16 harness straight draw thus making it adaptable to changes for other patterns. See Fig. 11.

Now another possibility for a combination of the two basic weaves would be to use the same 16-harness straight draw and to combine them to form a bar pattern. This is done by painting in one or more repeats of the plain weave horizontally across the full width of the harness used and then painting in one or more repeats of the satin weave in the same manner. This particular type of pattern is very adaptable to the box looms as one filling may be used for the plain weave and another for the satin weave. The pattern under discussion is shown in Fig. 12. Fig. 13 shows how the box chain would be indicated for the introduction of two fillings.

Fig. 12 and 13 represent two balanced patterns in that the take-up in every end is the same due to the same number of interlacings for each end. Should a vertical stripe combination be used such as shown in Fig. 14 two beams should be used in order to allow for the difference in take-up of the satin weave ends and the plain weave ends. In other words, all the ends that weave satin should go on one beam and all that weave plain should go on another. In combining weaves this is a most important point to watch as many apparently good designs are impractical due to the difference in take-up of various ends being too great. Where there is only a slight difference in the take-up of the ends the weave may be executed without difficulty.

Other possibilities may present themselves in the combination of these two weaves, depending on the ingenuity of the designer in making such trials that lead to a satisfactory arrangement. The examples given should give the lead in making good designs from such weaves.

Combination of the Twill Weave and the Satin Weave

The composition of designs using the twill weave and the satin weave represent other very interesting possibilities. As with various other weaves the weaves selected and the manner of putting them together give a wide field for the exercise of the creative ability of the designer. After the first efforts the beginner's work commences to assume some characteristic trend which gives to so many designs the interest needed to be salable. For our study here a 5 up 11 down twill weave was selected to combine with an 8-harness satin weave. See Figs. 15 and 16 respectively.

Now, of course, the reader probably wonders why these two weaves were selected instead of two other similar weaves. There is a distinct reason for the selection since just any two weaves will not combine properly. In this case the decision was based on the fact that an 8-harness satin with a counter of 3 has two distinct twill lines running through the weave; the one from right to left is a 45 degree line and the other a 70 degree twill running from the left to the right. Now a 5 up 11 down twill will fit in upon the 8-harness satin 45 degree twill line as will a 5 up 7 down twill; however the 5 up 11 down twill will be the one to use in the combination because there is enough space on the sinkers of the twill to show the satin weave distinctly. With such a combination the satin character of the combination is obscured and the result is a wide open twill. In form-

ing the combination the satin weave was dotted in for 2 repeats on 16 harness and the twill, which also repeats on 16 harness, was dotted in as shown in Fig. 17 with the twill line running in the direction of the twill line of the satin. In this case it was necessary to reverse the direction of the twill line of the satin or the twill. Since the satin was used as a base then the twill line of 5 up 11 down twill was reversed. After the composite design is made the direction of the twill may be reverse for the composite weave to suit the fabric. Here also it may be noted that the two weaves to combine satisfactorily must have a common multiple or must repeat on the same number of harness. Hence a 5 harness satin and a 5 up 11 down twill will not form a satisfactory combination. Also the twill line of the 5 harness satin is at a different angle in both directions from that of the 5 up 11 down twill.

In several of these combinations it will be noted that the weave is put on a 16-harness draft instead of using fewer harness. The reason for this is expediency in changing from one pattern to another in the loom without re-drawing the warp. The beginner will probably note with interest that on harness draws of 8, 16, 20 and 24 straight, so many of the small basic weaves are factors thereof. For instance a 4- and a 2-harness weave may work on 8 harness; an 8- and a 4-harness weave will work on a 16-harness draw as well as a 2-harness weave; on a 20-harness draw a 5-harness and a 4-harness weave will work out evenly; and on a 24-harness draw an 8-, 3-, 4-, 6-, and 12-harness weave will combine evenly. Of course other factors and other numbers of harness may be desirable for the combination and in that case the harness capacity is the only limit. The study of harness drafts and their relation to each other is quite a large subject in itself and this phase of designing will be covered in a later article.

Report of AATCC Papers and Discussion

(Continued from page 61.)

superior in appearance and fastness to those of a few years ago, and further refinements along these lines will improve still more the dyeing of this class of colors.

Mr. Smith's paper covered the dyeing of yarn in package form on the Obermaier machines.[9] The prime necessity of good winding was emphasized. Unless the entire lot of packages in a dyeing lot are of uniform density, uniform dyeings are an impossibility. The author dyes his yarn on solid perforated tubes, which makes uniformity of winding more necessary than if the yarn were wound on springs, whose compressibility would compensate for some lack of uniformity in winding. The importance of thorough wetting-out was stressed if uniform dyeings are to be obtained. The paper was illustrated by a moving picture of each process in the dyeing operation, from the winding of the package to the drying of the dyed yarn.

Considerable discussion of this paper followed, the main interest being centered on the particular type of machine used by the author, and the advantages and disadvantages of separate machines for boiling-out, dyeing and for drying with the need of transfer of the yarn packages into and out of three different machines.

Pigment Printing

Mr. Young gave a very interesting paper on pigment printing[10]. Owing to the fact that the colors in pigment printing are deposited on the fibers as actual color and are not developed there by any chemical reactions, good results require that the pigment be in particles of almost molecular size, and that they be incorporated in a vehicle that will penetrate to and cover the individual fibers, at the same time being so firmly bound to the fiber as to give the minimum of crocking and the greatest possible covering power. This vehicle must be so bonded to the fibers as to be unaffected by boiling water, hot soaps and dry cleansing operations. For a vehicle to possess the properties required for these results, it must be of low surface tension to obtain rapid wetting of the fibers, and at the same time to fill and empty rapidly the pores of the engraving. If these two requirements are met, great sharpness of line will result, and this can be accomplished with greater machine speed and less set. As the color is deposited as color and not later developed, color matching is simplified and positive control of the shade is at hand at all times. In addition, if the foregoing vehicle specifications can be met, incomplete removal of sizing before printing does not result in faulty fixation of the pigments as it does in the case of water vehicle pastes.

The speaker claimed the development to a point of successful application of a vehicle that will give the desired results with pigment printing. He exhibited a large series of cloth to illustrate the sharpness of line and splendid fastness properties of this type of coloring, as well as showing the great ease of matching shades.

This paper developed a marked degree of interest among the printers present, and gave rise to considerable discussion of a very technical nature.

Screen Printing

Mr. Green's paper on screen printing[11] also aroused much interest and discussion. He gave a detailed description of the methods of preparing the printing screens and their subsequent use in the printing operation. Screen printing was stated to be especially adapted to two classes of work. It is of value where the size of the repeats is so large as to make regular printing cylinders unwieldly and expensive on account of their great size, and especially where runs of a particular pattern are so short that machine printing with engraved rolls would be too expensive. As a result, the method is especially adapted to novelties of high class. The operators of screen print works operate small establishments and employ small crews who are men of some artistic ability. The work of the screen printer, being all hand work, is slow as compared with cylinder work. The process is capable of as many combinations as is machine work, and, on account of the combination shades being built up by slow manual application of the color phases, very careful control of the shades is possible. It is possible that screen printing may lack the sharpness of line definition of the cylinder print, but the examples shown were excellent. Screen printing will always occupy a place where novelties are in demand and exclusive patterns desired.

(9) "Modern Package Dyeing Equipment", by Thomas R. Smith, Wiscassett Mills Co., with motion picture presented by W. A. Wolhar, of Rosemary Mfg. Co.

(10) "Some Fundamental Differences in Printing with Pigments", by Henry L. Young, Aridye Corp.

(11) "Screen Printing", by Ralph D. Greene, The Calco Chemical Co.

CURRENT TEXTILE TOPICS ....

Talk of the Month

LOOKING AHEAD at the middle of December for the textile industry was a matter of gauging the effect of favorable outside circumstances upon uncertain internal conditions. Early in the summer the mills led the economic procession in a spurt toward recovery. Textiles generally had several spurts in the ensuing six months, but the intervals of slackness brought a check each time to healthy trends. Thus the cotton mills came to the end of the year without emerging from inordinately low prices or backlogs for full operation.

Cotton mill industry looks through uncertainty hopefully

Vicissitudes of direct and indirect nature beset the industry in the last six months. Uncertainty over raw cotton was a constant deterrent to better prices. Political disturbances in Europe were a recurrent source of unsettlement, in this respect the mills feeling the general upset. Then after the November elections caused a wave of optimism toward the future of business, the signing of the Anglo-American trade pact created new misgivings for textile manufacturers for the year ahead.

Fall economic developments on the whole, however, were decidedly favorable and created the confidence that the fundamentals were sound for a long period of upward progress in all directions. Lest we be too much in the midst of affairs at home to appreciate our own progress, it is worthy of notice that competent observers abroad toward the end of 1938 were aware of a definite change here. They were citing progress in this country as a force for improvement in the world picture.

More Money to Spend

December found the family purchasing power substantially raised since the summer. That was a reflection of rapid industrial expansion for five months. While payrolls were increasing, there was no parallel advance in the cost of living. The index of retail prices was unchanged most of the period and actually lower through the fall than at the beginning of the summer. Thus it was that dollar volume of retail business lagged below that of 1937, late in the year, though buying was active.

Rising demand was reflected in the cotton industry by the trend of raw material consumption. At mid-December the government reported November cotton consumption at 596,289 bales, against 542,778 in October and only 482,976 in November, 1937. October also was above the corresponding period a year before, the first month of such relative gain since August of 1937. Even if the December figure is shown under November, it will hardly fall to the 433,058 of December, 1937.

Early December was a time of complexities. Buying had slackened perceptibly, and was again well below the rate of production, at the same time that the merchandising situation pointed to growing requirements among converters of gray goods. The result was threat of new curtailment—not only of holiday closings for a week at the year-end, but a considerable retrenchment for some time into the new year—a condition extraordinary when the fundamentals were the best for years.

Before the new curtailment plan got into effect, however, it began to appear that buyers were again testing the market. The latent needs of converters first were revealed in bids for good quantities below quoted prices. When it was found that mills contemplated restricted output and were content to carry their stocks for a firmer market, the buyers evidently saw their attitude to be futile. Suddenly inquiries began to blossom into substantial orders, in response to the mill policy, together with reports of active retail business in cotton merchandise and other exhibitions of economic improvement along several fronts.

At the time of writing, we have not had a chance to measure the start of 1939, but the year came in with goods marketing prospects balanced in a way that has not been seen for nearly ten years. By that we mean that the previous broad movements in recovery from depression have not found the building industry contributing to make a well rounded progress toward normal. Now the heavy industries are leading and the obvious result is that cotton manufacturers may count on the most diversified demand for probably a decade, or nearly so.

This means much both to the growers of cotton and the manufacturers, as the industrial uses for cotton demand fabrics absorb three or four times the amount of staple per yard that goes into lines for consumers. It might easily turn out that the sale of heavy constructions is just the leaven that has long been needed to restore the cotton industry to a profitable basis. For some time the industrial buyers have shown interest, based upon need for replacement buying.

It may be six months before the effects of the British trade treaty become clear through competition. One feature causing concern meantime, is not so much the potential competition from Great Britain as that from Japan under the automatic extension of benefits to other favored nations. Other indirect effects, such as competition from linens under reduced duties, are feared.

Recent remarks at Durham, N. C., on rayon use in cotton mills by Dr. Claudius T. Murchison, president of the Cotton-Textile Institute, are teeming with significance for the future. Since his talk it has been brought out that government statistics on cotton spinning are somewhat misleading, because so much machinery has been put on staple rayon.

It is suggested that the change is so important as to make advisable separate reporting of spindles on cotton and those on rayon.

New England Mill Situation

NEW ENGLAND cotton mill owners were glad to ring out the old and ring in the new year in 1939. The past year was one of stop and go, with more of the former than the latter. Partly internal, but to a great extent external, factors were confronted to check every auspicious movement toward a normal market. The last of these—the Anglo-American trade pact—still remains to exert its effects, but otherwise the new year is promising because of the general economic outlook.

Sound production schedules by the fine-goods division of the industry through the long period beginning with the start of the secondary depression in the late spring of 1937 had up to late fall of 1938 profited the mills nothing. This was demonstrated by the prevailing loss reports in November and December (and some earlier) for the fiscal years that ended in the summer or fall. The answer is that broad trade recovery was a prerequisite to normal mill conditions—and that unsound competition ruled again in depression.

Such recovery came in the last five months of the year, with a rapidity of industrial gains seldom seen. Of course it came from an extremely low level, leaving normal conditions still to be achieved. Then, too, perhaps the very rapidity of progress left buyers behind. At any rate, there was a very noticeable caution maintained by purchasing departments and the holiday season found a freer spending public catching the stores without adequate stocks.

Fine goods manufacturers in the cotton textile field reported somewhat of a counterpart to this situation. Driblets of orders were keeping prices down to discouragingly low levels. At the same time mill production had been kept down and it was indicated that considerable business in fancy goods would be lost through deferment of orders until too late to meet the seasonal need. One apparent reason was that mills were pursuing a sound curtailment policy without enough noise: in other words, buyers evidently expected to find spot stocks in quantity.

At the annual meeting of the Nashua Manufacturing Company, a loss for the year ended Oct. 31 of $242,814 was reported, against a profit the preceding year of $553,591. "Prices throughout the first half-year declined under the desperate and unwise competition in the industry," said the president, Robert Amory. "While some improvement has lately taken place [meeting in December] prices remain unprofitable in most cotton textile lines for all save the most efficiently run and best situated mills."

As to the future, Mr. Amory said it was more difficult than ever to prophesy "because, in addition to the many factors naturally entering into business, there is the total unpredictability of governmental action." This makes "planning ahead for any company a great responsibility fraught with many dangers." However, he pointed out that business was sharply declining in the last two months of 1937 and improving for the same period of 1938.

Russell T. Fisher, president of the National Association of Cotton Manufacturers, shortly before the date on which the Anglo-American trade treaty was to become effective, said that "any sound prediction as to its effect is impossible until the treaty has been in force for at least six months." He distributed to members, however, an analysis of the tariff revisions affecting cotton goods.

Previously Mr. Fisher had said that, through its concessions the Administration "has traded away employment in textiles". As support for this contention, he cited an average wage in English mills of less than 20 cents an hour, against more than 44½ cents in northern mills of this country; also an English work week of 48 hours versus 40 as a rule here.

Another thing outside the realm of prediction is that "in a few instances," says Mr. Fisher, "we have been advised by mills that many of the fabrics they have been making can now be imported from England at prices below those which American mills can meet. In these cases, at least, it is clear that increased unemployment will result from the treaty."

Lack of consistent good business for any long period for mills over a period of many years continues to take its toll of well-known enterprises in New England. The Farr Alpaca Company, of Holyoke, is the latest deciding upon liquidation. It was formed in 1873 and the capitalization was given as $7,000,000. A loss of $2,740,000 was reported for the fiscal year ended April 30. The change of lining trade to rayon was an important factor in its difficulties.

"THE SITUATION"

As Seen Across an Executive's Desk

December 16, 1938

THE PAST FOUR WEEKS have been extremely important in the ratio of events affecting the textile industry.

After many months of waiting, the Anglo-American trade treaty was finally signed on November 17. Under this treaty all benefits go automatically to the so-called "most favored nations". In other words, every country, with the exception of Germany, benefits equally with the United Kingdom.

The Trade Treaties

The agreement with the United Kingdom and Canada becomes effective January 1, 1939, for an initial period of three years and may continue in force indefinitely thereafter, subject to termination by either government on six months notice. The most important concessions were furnished by the textile industry of the United States, which industry employs approximately 1,300,000 workers. Forty concessions were made on cotton goods covering chiefly yarns of finer counts and cloth in the higher price ranges. Concessions on cotton yarns were confined to those numbers above 60s; concessions on counts from 61s to 80s

ranged from 1 per cent to 14 per cent under the Tariff Act of 1930.

Immediately upon publication of the reductions and tariff rates, protests were registered by manufacturers of finer goods who felt that the trade agreement would be a serious handicap to that section of the textile industry. However, until the British release their yarn prices upon the effective date of the treaty, it is impossible to give a price comparative schedule on yarns of 60s and upon which duty concessions have been made, and until such a price comparative can be obtained we can not anticipate how much or how little damage will be done to the industry resulting from future competition from the United Kingdom under this treaty.

The treaty makes concessions on many items affecting the textile trade, directly and indirectly, in addition to yarns, such as cotton cloths not bleached, dyed, or colored, containing counts exceeding 80s reduced from 18.9 to 30 per cent ad valorem equivalent of rate under agreement. A large number of schedules too numerous to mention of various cotton fabrics of the finest quality are reduced to around 20 to 40 per cent. Wool, flax, jute, and linen likewise carry equally as substantial reductions.

The agreements carry no quantitative restrictions on the textile productions granted concessions. However, either country is privileged to restrict quantity of imports under certain conditions.

The treaty with Canada seems to be based upon the general idea that Canada will import from the United States textiles and other products and will admit our agricultural products, while in return Canada will find a ready market in the United States for quantities of goods, agricultural and other products under quotas; while the treaty with the United Kingdom apparently presupposes that the United Kingdom will export to the United States enormous quantities of manufactured goods, and in return will establish a substantial market for American wheat, cotton, and other agricultural products, as well as provide a substantial market for other manufactured products of this country. We do not understand, however, that it is expected that the terms of the treaty will open up markets for the American textile manufacturers in the United Kingdom but on the other hand that in the manufacture of finer yarns and cloths containing finer numbers, the United States will now maintain a better and larger market for the textile manufacturers of the United Kingdom.

It was said that the paeans of praise from Washington and London concerning the trade treaty had a hollow ring to the ears of finance experts who said the agreement could not mean much unless something was done to stabilize the international currency situation. The negotiators of the treaty were obviously aware of this as the treaty contained hedge clauses which provided for the cancellation "if currency fluctuation tends to defeat their purpose".

The devaluation of the franc and the pound sterling which followed almost immediately upon the signing of the trade treaty portends that such a provision may turn out to be more important than is generally suspected.

There was a rumor in Washington that the trade treaty would be held up until an understanding had been reached on the rate of currency exchange. But it is said that President Roosevelt and Secretary Hull decided that the gesture of Anglo-American cooperation had to be made at that time, for Mr. Hitler's benefit, regardless of other considerations. This is just a piece of back-stage gossip and we can not vouch for its authenticity.

Wages-and-Hours Hearing

We have had the "Washington-trots" recently on wage-hour work. It is recalled that in the early part of November the textile industry was divided into small groups and each group was asked to submit data as to the probable effect in that group of a minimum wage order applying to the textile industry as defined, a minimum wage rate of (a) 30 cents; (b) 35 cents; (c) 40 cents. The information was requested by the Committee of 21. At a co-ordination conference in Washington at which officials from all textile associations were present, it was agreed that in order to forestall any overlapping of data a single brief should be prepared by The Cotton-Textile Institute for submission to Industry Committee Number One at a hearing on December 14.

With the information gathered and submitted by the Cotton Textile Institute, this committee (composed of seven members each from the industry, the public, and organized labor) should have a minimum of trouble in setting a rate for the industry on wages and hours.

On December 21, Administrator Andrews issued an administrative order defining the "textile industry". The definition eliminates the manufacturing and processing of knitted fabrics from Industry Committee No. 1 for the Textile Industry, and incorporated certain other textile processing usually conducted in textile mills. The text of the official definition of the textile industry follows:

"A—The manufacturing of processing of yarn or thread and all the processes preparatory thereto, and the manufacturing, bleaching, dyeing, printing and other finishing of woven fabrics (other than carpets and rugs) from cotton, silk, flax, jute or any synthetic fiber, or from mixtures of these fibers; except the chemical manufacturing of synthetic fiber and such related processing of yarn as is conducted in establishments manufacturing synthetic fiber.

"B—The manufacturing of batting, wadding or filling and the processing of waste from the fibers enumerated in Clause A.

"C—The manufacturing, bleaching, dyeing or other finishing of pile fabrics (except carpets and rugs) from any fiber or yarn.

"D—The processing of any textile fabric, included in this definition of this industry, into any of the following products: bags, bandages and surgical gauze, bath mats and related articles, bedspreads, blankets, diapers, dish-cloths, scrubbing cloths and wash cloths, sheets and pillow cases, table cloths, lunch cloths and napkins, towels and window curtains

"E—The manufacturing or finishing of braid, net or lace from any fiber or yarn.

"F—The manufacturing of cordage, rope or twine from any fiber."

Hearings on "learner" exemptions for the cotton textile industry opened November 28 before Merle D. Vincent, chief of the hearings for exemptions section of the wage-hour division.

A "Learning" period of nine weeks during which mill owners would pay workers 70 per cent of the minimum wage, plus a suggestion that not more than 4 per cent of the total number of employees of any employer be classified at any one time, was recommended by The Cotton-Textile Institute, representing the textile industry. Immediately upon making such

recommendations a parade of union and labor officials, all in opposition to the proposal, brought the first of the exemption hearings to a close. CIO and AFL joined forces in their pleas that the administrator of the act take no step that would legalize a minimum wage for "learners" below that provided for in the wage-and-hour bill. At the close of the hearing, in view of the fact that the industry committee was still deliberating on the wage rates of the industry, a request for permission to withdraw the application for a "learner" exemption was made. The request was granted by the administrator, but this does not prejudice the industry from making application at a later date should it so desire.

Government Classing of Cotton at the Gin

The Department of Agriculture has launched another campaign "to help the farmer". During the last session of Congress a proposal was made by the Senate committees conducting the cotton investigation to the effect that the "Secretary of Agriculture be asked to submit for the consideration of the next session of Congress a proposed bill providing under government supervision and regulations classifications of all cotton produced in the United States in such a manner that the official government classification of every bale so produced may be made available to the producer at the earliest practicable date after ginning, and so that such official government classification shall follow each bale through the channels of trade until consumed." A series of meetings have been held this month under the direction of C. W. Kitchen, associate chief in charge of service and regulatory work of the Bureau of Economics, United States Department of Agriculture, in order that interested groups may have an opportunity to discuss the following questions:

(1) Reliable methods of sampling that will identify the sample with the bale from which it is drawn in such a way and under such conditions that there will be no question in the minds of buyers as to the reliability of the sample.

(2) The maximum number of days after ginning that the producer could reasonably wait for his classification.

(3) Practical methods of carrying out the recommendations "that such official Government classification shall follow each bale through the channels of trade until consumed."

It was one of those rare occasions when shippers and manufacturers stood shoulder to shoulder in their way of thinking as both phases of the cotton business (selling and processing) protested this move on the part of the government.

As far as the manufacturer is concerned, there is every reason to object to such a proposal as is being considered for possible Congressional legislation. In the first place, cotton which is classed at the gin in a comparatively "green" state is apt to lose every claim to that particular staple class before it gets to the mill. It is estimated that cotton as it enters the picker room at the mill has been classed at least five times. Five times it has been scrutinized and culled, and in probably every case several bales of the original purchase lot have been cast aside as being unfit for the mill's specifications.

Each mill has its own peculiar requirements for cotton, its own characteristics. It is not unusual to hear a salesman for a reputable cotton shipper say as he goes through a large lot of samples, "I'll place this sample aside—it's just exactly the kind that Mr. X likes to use at his plant," or "These 25 bales could be used by such-and-such a mill, but the rest of the lot will not come up to their requirements." The point we are trying to bring out is that a classer at a small gin, or a large gin, hundreds of miles from a manufacturing center, who never saw the mill which might get the cotton being classed is not fitted to place a permanent classification on a bale—when such a classification will have to be accepted straight through all channels of cotton trade until it reaches the final consumer, Mr. Millman.

We know of one mill which is so particular that cotton used there is classed to the 64th of an inch. We know of dozens and dozens who class their cotton to the 32nd of an inch, and we know that a variance of 1/32 in a bale means on present market around $7.50 per bale. It means more than that—it means acceptance or rejection of goods; it means goodwill of the customer; it means that the mill can deliver what it contracted to sell.

National Cotton Council

One of the most spectacular moves on the part of the raw cotton dealers was the formation in Memphis of the National Cotton Council at which representatives from fourteen cotton growing states speaking for ginners, farmers, shippers, warehousemen, and cotton seed crushers elected Oscar Johnston, head of the largest cotton plantation in the world, as chairman of the Council. An ultimate goal of $2,000,000 and an immediate war chest of $240,000 for the promotion of new uses for cotton is proposed, the money to be raised by assessments of 2 cents a bale on every bale of cotton grown.

The National Cotton Council adopted a five point platform as follows: (1) A domestic advertising campaign. (2) Cultivation of good will toward American cotton in foreign markets. (3) Stimulation of international commerce with industrial nations. (4) Scientific research for discovery of new uses and for improvement of manufactured products to increase consumption in known uses. (5) More equitable and favorable transportation rates between the cotton belt and other sections of the nation.

And so, with the raw cotton industry united for the first time in history in any sort of program to promote the use of their commodity we can not help but feel extremely optimistic for the future. The fact that one of the most brilliant minds in the country, a shrewd business man and an untiring worker with great vision, is embodied in the chairman of the National Cotton Council, makes one just positive that this time a cotton promotion campaign will amount to something.

We can not help but feel optimistic as far as the textile industry is concerned. The general business recovery since June has been one of the most rapid on

record for a similar period. The industry has been effective in the last six months in improving the inventory situation and in keeping production within proper bounds. However, the cotton mills as a whole are in desperate need of better prices. Many financial reports show that the mills have undergone tremendous losses. On the other hand, with such a splendid average statistical position in the textile industry plus an anticipated general business uptrend, if cotton textile executives had the profit minded nature of their fathers we would pull out of this recession mighty quick.

COMMENT on the Cotton Market

New Orleans, December 16, 1938

IN CONTRAST with price developments in the first half of the period the cotton market of late possessed a firmer, undertone due largely to reductions in estimates of foreign and domestic production and owing to improvement in the American textile trade. As yet, however, there remains uneasiness over the European political situation as a result of recent developments abroad—the aspirations of Germany and Italy for additional territory.

Government Crop Estimate

The Government's final crop estimate of the season showed a further decrease of 129,000 bales, but did not change the total supply of American much, the indicated crop pointing to 12,008,000 bales versus 12,137,000 the previous month and 18,946,000 last year.

Concerning foreign production, however, there was also made a subtraction from earlier estimates. The Garside Service report on foreign crop prospects was reported as showing a decrease of 2,164,000 bales, or a total of 16,000,000 bales against 18,164,000 bales last year. All countries except Russia show a smaller crop than last year, viz. —Brazil 1,950,000 bales versus 2,108,000; China 1,500,000 versus 2,400,000; Egypt 1,600,000 versus 2,259,000; India 4,600,000 versus 4,942,000; Russia 3,500,000 versus 3,482,000; other countries 2,850,000 versus 2,973,000.

As regards the world's probable production of all kinds of cotton, figures available indicate a total of 27,850,000 bales versus 36,576,000 bales last year.

Were it not for the large surplus of American and foreign cotton carried over this year, the big reduction in world production would be significant, but with a world surplus of all kinds this year of about 23,000,000 bales versus about 13,000,000 last year, the loss in production this year seemingly loses its influence as a price-making factor.

As the old year draws to a close there is a ray of hope and encouragement in general business for the future, as late returns are of an encouraging nature. The cotton market is ruling steady, sustaining features being the loan program, the late improvement in the goods market and light offerings of spots. On the other hand there is no urgent demand for spots, exports continue small, there is some uneasiness as regards political conditions in Europe, and the future of the farm program for next year tends to restrict operations. Recently Secretary Wallace was quoted as announcing: "The cotton acreage quota would be 27,500,000 acres, which compares with 26,144,000 acres planted last season."

The discouraging feature of the whole cotton situation is the falling off of exports of raw cotton from the United States, for the past week only 53,000 bales versus 136,000 last year, and thus far this season 1,864,000 bales against 3,026,000 to even date last season. Apparently foreign countries are underselling America abroad.

CENSUS REPORT DECEMBER 14, 1938

United States— Bales—	This Season	Last Season
Consumption of lint, November	596,000	483,000
Consumption of lint, 4 months	2,235,000	2,212,000
Mill stocks, November 30	1,714,000	1,654,000
Stock in public storage and warehouses, November 30	15,578,000	11,553,000
Stock in mills, public storage and warehouses, November 30	17,292,000	13,207,000
Stock in mills, public storage and warehouses, October 31	16,820,000	11,189,000
Con. of lint in cotton growing States, Nov.	504,000	417,000
In New England States, November	77,000	54,000
In all other States, November	15,000	12,000
In United States, November	596,000	483,000
Consumption of lint in cotton growing States, 4 months	1,893,000	1,882,000
In New England States, 4 months	279,000	271,000
In all other States, 4 months	63,000	59,000
In United States, 4 months	2,235,000	2,212,000
Active spindles in United States, Nov.	22,449,000	22,778,000
Active spindles in United States, Oct.	22,114,000	23,715,000
Active spindles in cotton growing States, November	17,026,000	17,375,000
Active spindles in New England States Nov.	4,797,000	4,756,000
Active spindles in All other States, Nov.	626,000	647,000

AMERICAN COTTON

August 1 to December 16— Bales—	This Season	Last Season
Brought into sight (marketed)	8,364,000	11,110,000
Exports from the U. S. including Canada	1,864,000	3,026,000
Spinners taking, world	5,330,000	5,520,000

WORLD'S VISIBLE SUPPLY OF COTTON

December 16— Bales—	This year	Last year
Stock at all U. S. ports	3,094,000	3,287,000
Stock at 102 interior towns	4,841,000	3,528,000
Afloat to and at ports of Europe	1,238,000	1,604,000
Afloat to and at ports of Orient	206,000	167,000
Total world's visible of American	9,379,000	8,586,000
World's visible of other kinds	2,035,000	1,592,000
Total world's visible supply of all kinds	11,414,000	10,178,000

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How to Correct Workers When They Don't Co-Operate With Superiors

1. If you are not getting full cooperation from a man under your supervision, first ask yourself if your own tactics in dealing with him are such as will arouse in him a natural desire to pull with you or against you.

2. Make sure that you cooperate fully with him. Cooperation is a two-way relationship.

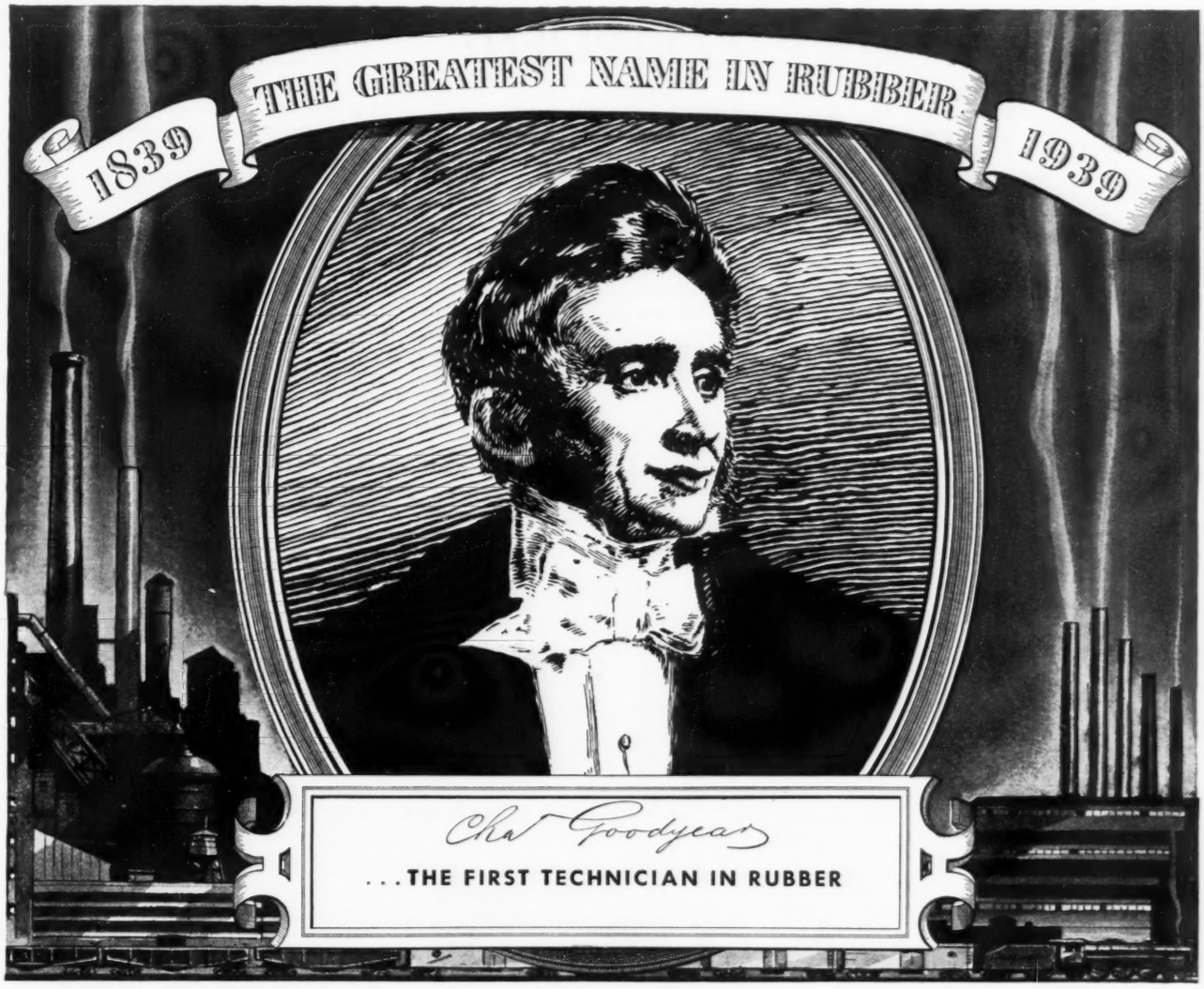
3. Make clear to him the results you are seeking, and explain fully how he can help you.

4. Make your instructions complete, understandable, and considerate. Misunderstanding is often mistaken for non-cooperation.

5. Point out to him all the ways in which he stands to gain by cooperating with you.

6. Cooperation must be won—it can't be forced.

—"Management Information", Elliott Service Co., Inc.



"Notwithstanding all the difficulties he encountered, he went on. If there was reproach, he bore it. If poverty, he suffered under it. But he went on, and people then saw, when his invention was completed, that what they had been treating with ridicule, was sublime; that what they had made the subject of reproach, was the exercise of great inventive genius; that what they had laughed at, the perseverance of a man of talent with great perceptive faculties, with indomitable perseverance and intellect, had brought out as much to their astonishment, as if another sun had risen in the hemisphere above. . .

"I believe that the man who sits at this table, Charles Goodyear, is to go down to posterity in the history of the arts in this country, in that great class of inventors, at the head of which stands Robert Fulton . . . in which class stand the names of Whitney, and of Morris, and in which class will stand 'non post longo intervallo' the humble name of Charles Goodyear."

From the address of DANIEL WEBSTER *before the U. S. Circuit Court, District of New Jersey, in 1852.*

HE DISCOVERED *the process of vulcanization that gave us rubber as we know it today.*

He was first to conceive rubber's wide application in meeting industry's many problems.

He built the first practical rubber belting and demonstrated its efficiency over other kinds.

He fashioned from rubber the first successful hose for handling air, steam, oil, acids and other solvents.

He shaped the first enduring rubber molded goods; contrived from rubber the first dependable packing for steam engines.

In all he either manufactured, patented or envisioned more than one thousand different applications of rubber before his death 79 years ago.

His name was Charles Goodyear. He was the first technician in rubber.

◆ ◆ ◆

● This year marks the One Hundredth Anniversary of Charles Goodyear's discovery of vulcanization. In recognition not alone of his great contribution to the world but also of the self-sacrifice, the faith and courage of the man, this tribute is published by an enterprise founded long after his death — a business that, inspired by his example, seeks by serviceability to deserve his name. Dedicated to that service today is the G.T.M.—Goodyear Technical Man—who in countless new industries of which Charles Goodyear never dreamed carries on his work of multiplying rubber's usefulness through specialized application to industrial needs.

THE GOODYEAR TIRE & RUBBER COMPANY
AKRON, OHIO

New Textile Equipment and Materials

New Series of Counting Machines

Durant Manufacturing Co., Milwaukee, Wis., and Providence, R. I., have announced a new series of counting machines, stream-lined in design, with

New counter design . . .

gray crackle finish cases, known as the "Series H Productimeters". Oilless bearings, cut gears for smoothness and accuracy in operations, and increased visibility through the use of metal number wheels with large black figures on a white background, showing through louvered windows, are among the new features. The counters are made in 20 variations, with five or six dials. Either stroke or revolution counters are available; non-reset, or with wing nut reset, or tumbler lock set to prevent tampering. Operating levers or shaft extensions are available, with either clockwise or counter-clockwise direction of rotation.

◆

New Carbic Colors

Carbic Color & Chemical Co., Inc., 451 Washington St., New York City, announce two new colors, Indigosol Brilliant Violet 14R and Indigosol Brown IVD. The violet is a new product to yield clear, reddish violet shades on vegetable fibers, with good fastness to washing, chloride and peroxide, and, with proper precautions, for color bleaching. On vegetable fibers, the dyeing is done by the nitrate process; the color is especially recommended by the manufacturers for beck or machine dyeing, and particularly for the one-bath process. In printing, it is best applied by the nitrate process with preliminary steaming or by the Indigosol developer D-chlorate steaming process.

The Indigosol Brown IVD, on cotton, rayon and mixed fabrics, yields covered, violet-toned brown shades with good light fastness, it is pointed out, and may be used in direct printing with Rapidogen and Rapid Fast dyestuffs.

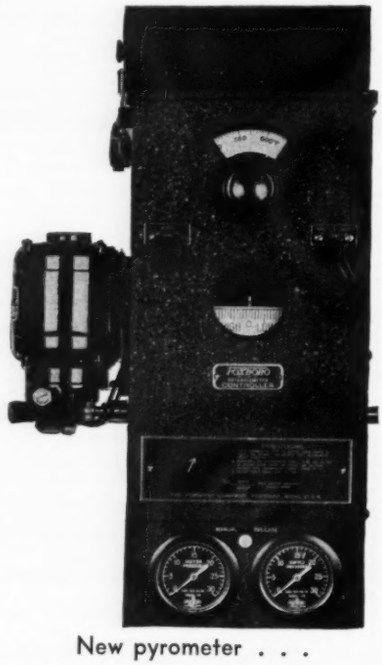
Fluorescent Lighting Fixtures

The Miller Company, Meriden, Conn., have introduced fluorescent lighting reflectors for use with the new fluorescent Mazda lamps. These new lamps, it is explained, give several times as much light as ordinary lamps of the same wattage, giving a close approach to real day-light at high efficiency and lower temperature. The new lighting reflectors are offered for factory locations for fine assembly, close inspection and other applications where form and color must be checked closely; in offices the fluorescent reflectors provide direct light without undue lamp brightness and without perceptible heat, it is pointed out.

◆

Potentiometer Control Pyrometer with Air Operated Valves

The Foxboro Company, Foxboro, Mass., have announced a new potentiometer control pyrometer, combining the features of electrical temperature



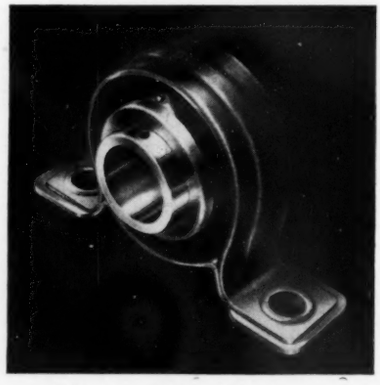
New pyrometer . . .

measuring methods with the simplicity and dependability of controlled valves operated by air diaphragm motors. It is designed to actuate air-operated valves which are unaffected by dampness, oily vapors and corrosive atmospheres and are free from arcing and sparking electric contacts. In this instrument, by means of a fixed setting of the temperature dial and slide wire contact position, the mechanism for detecting temperature change acts directly in defecting galvanometer deflection, thus transmitting in control action the full sensitivity of the measuring system.

◆

Rubber Flex Pillow Block

S K F Industries, Inc., Front Street and Erie Avenue, Philadelphia, Pa., has introduced a new "Rubber Flex" pillow block, comprising a self-locking bearing of the S K F "Grip-lock" type. This



Aligning pillow block . . .

bearing is inherently aligning, to compensate for inaccuracies of set-up and conditions of shaft misalignment without binding. The bearing is encased in a pressed steel housing equipped with felt seals to exclude dirt; the housing is provided with means for lubricating the bearing. The bearing and housing are surrounded with an elastic material with special sound-absorbing characteristics, and the material has been specially treated to make it impervious to oil and grease. The units are now available in the ¾- and 1-inch shaft sizes.

◆

Fluorescent Lamp Equipment

Curtis Lighting, Inc., 1123 West Jackson Boulevard, Chicago, Ill., announce new equipment for fluorescent lamp installations, including exposed or concealed applications, single lamp assemblies, continuous linear assemblies, suspended or surface mounted installations, cove, recessed or trouth lighting. The new equipment utilizes the Curti-Strip simplified wiring channel.

◆

Stampagraph Opens New Southern Branch

Stampagraph Co., New York City, have opened a branch in Hickory, N. C., making three in that state, the others being in High Point and Burlington. The company manufactures dry transfers, embossed seals and labels. George Chadwick is president, and announces another plant will be opened soon in Chattanooga, Tenn.

. . . and you get more for your money today with the modern roll covering— **CORK**

THE top-rank movies of yesteryear seem feeble fare compared to the Hollywood hits of today. Modern equipment helps bring greater pleasure to millions. Times have changed in the textile industry, too. For here again, modern, scientifically developed roll covering helps bring greater profit to mills. That is why today 6,000,000 active spindles are running on Armstrong's Seamless Cork Cots.

A change-over to Armstrong's Cork Cots means lower operating costs. Cork cots last longer. They can be rebuffed quickly and inexpensively and then placed back in service. They also save money in faster, cheaper assembly. Yet with all these advantages, cork cots cost no more than other types of roll covering materials.

A change-over to Armstrong's Cork Cots means smoother running work, less eyebrowing, and reduced end breakage. It means less clearer waste and fewer top roll laps.

A change-over to Armstrong's Cork Cots means stronger, more uniform yarn. The natural properties of cork make it ideal for cotton spinning. Scientific fabrication molds these properties into absolutely identical cork cots, every one precisely uniform from end to end and throughout its entire wall thickness. That's why Armstrong's Cork Cots deliver uniform yarn.

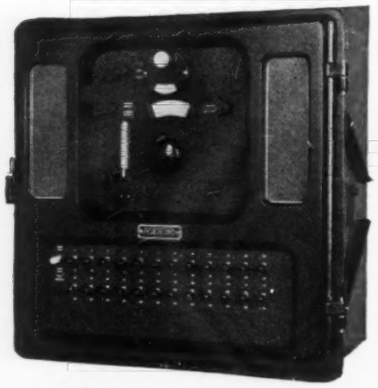
Find out now how your mill can benefit by a change-over to the modern roll covering—Armstrong's Seamless Cork Cots. Let an Armstrong representative show you production figures of mills spinning your range of numbers on cork. Or write to Armstrong Cork Company, Industrial Division, Textile Products Section, Lancaster, Pennsylvania.

ARMSTRONG'S *Extra Cushion* SEAMLESS CORK COTS

CORK PRODUCTS SINCE 1860

Key-Switch Cabinet Indicating Potentiometer

The Foxboro Company, Foxboro, Mass., have announced a new key-switch cabinet indicating potentiometer to provide centralized temperature indication for numerous and scattered points in industrial plants. As many as 82 switches may be obtained on the key-switch panel. Switch identification



Indicating potentiometer

panels are arranged for maximum convenience beside the indicating panel containing the scale and vernier dial-knob. The instrument case is of the universal type, for surface mounting on the wall or flush mounting through the instrument board.

◆

New Publications of Textile Interest . .

(These publications may be secured direct from the manufacturer or through COTTON.)

Book on Handling Problems

"How Handling Problems Have Been Solved" is the title of a 48-page book issued by The American MonoRail Co., 13107 Athens Ave., Cleveland, Ohio, presenting in pictorial form many solutions to industrial handling problems, in a variety of industrial plants.

◆

Annual Cotton Handbook

Comtelburo, Limited, 11 Tokenhouse Yard, London, E. C. 2, with New York office at 68-70 Beaver St., have published the current edition of the "Annual Cotton Handbook". This is the 68th year of publication of this reference book containing complete statistical information as to world cotton crops and markets—the most complete record in regard to cotton.

◆

Looms for Woolen & Worsted

Crompton & Knowles Loom Works, Worcester, Mass., have issued an attractive brochure descriptive of looms for weaving worsted and woolen fabrics, and containing much statistical information on this phase of the textile industry. Figures from the recent C. & K. survey reveal the situation as to age of looms now in place; and the booklet describes the company's W-2 and W-3 looms, with data on mill performance, as to speed looms per weaver and fixer, shuttle and bobbin size, etc., on a variety of woolen and worsted fabrics.

◆

Booklet on Ball Bearings

New Departure Division, General Motors Corp., Bristol, Conn., have announced publication of the 1939 edition of their Ball Bearing Interchangeability Tables in Booklet form.

◆

New Literature on Surface Active Chemicals

E. F. Houghton & Co., 240 West Somerset St., Philadelphia, Pa., have issued leaflets describing two new surface active chemicals—Surfax and Surfax W. O., with factual data and charts. It is pointed out that these surface active agents possess especial wetting-out and softening properties, and that Surfax also possesses high detergent properties.

◆

Winding Production Chart

Universal Winding Company, Providence, R. I., are distributing a new winding production chart, with which it is readily possible to calculate pounds per spindle production in 8 and 40 hours, with the yarn count, average yarn speed and percentage of efficiency given.

◆

Catalog on Harness Frames

Steel Heddle Mfg. Co., Philadelphia, Pa., have just issued a catalog covering harness frames. It is 28 pages, containing cuts which illustrate every known type of harness frame and accessory.

TIMELY NEWS ITEMS WITH A TEXTILE SLANT . . . .

New Hercules Ethyl Cellulose Plant

The first step in an expansion program for the manufacture of ethyl cellulose was announced last month by officials of Hercules Powder Company, Wilmington, Del. Work will begin at once on the construction of a new ethyl cellulose plant at Hopewell, Va.

At the present time, Hercules ethyl cellulose is manufactured in a plant at the Hercules experiment station, near Wilmington, Delaware. Transfer of all ethyl cellulose manufacturing activities to Hopewell will be made as soon as the new plant is completed. The new unit provides Hercules with increased production facilities to keep pace with the growing demand for ethyl cellulose.

Ethyl cellulose, in the opinion of competent observers, is one of the most promising new materials introduced in the United States in recent years. It is used in lacquers, varnishes, plastics, synthetic finishes, textiles, films, paper, and many other products.

One of its most important properties is that it retains flexibility at extremely low temperatures. For example, at the Chemical Show in New York, films of ethyl cellulose were flexed all week over dry ice at a temperature of minus 78.9 degrees centigrade.

Ethyl cellulose is much lighter in weight than other cellulose compounds. It is unusually tough, resists alkalies and weak acids, is widely soluble in most solvents, and is non-flammable. Recognition of these properties by industry is responsible for the construction of the new plant by Hercules.

◆

L. E. Taylor Promoted by National Ring

L. Everett Taylor has been named to succeed his father, the late Charles Dobbs Taylor, as southern agent of the National Ring Traveler Co., with headquarters in Charlotte, N. C. Everett Taylor has been connected with the company since he was graduated from college 15 years ago, and has traveled throughout the South, more recently making headquarters in Atlanta. H. B. Askew will remain for the company in the Georgia-Alabama-Tennessee territory, with headquarters in Atlanta. William S. Johnstone, son of Gordon A. Johnstone, of Gastonia, N. C., has joined the sales force of National Ring Traveler Co., and after a training course at the factory in Providence, will represent the company in North Carolina, with headquarters in Gastonia.

Mr. Taylor

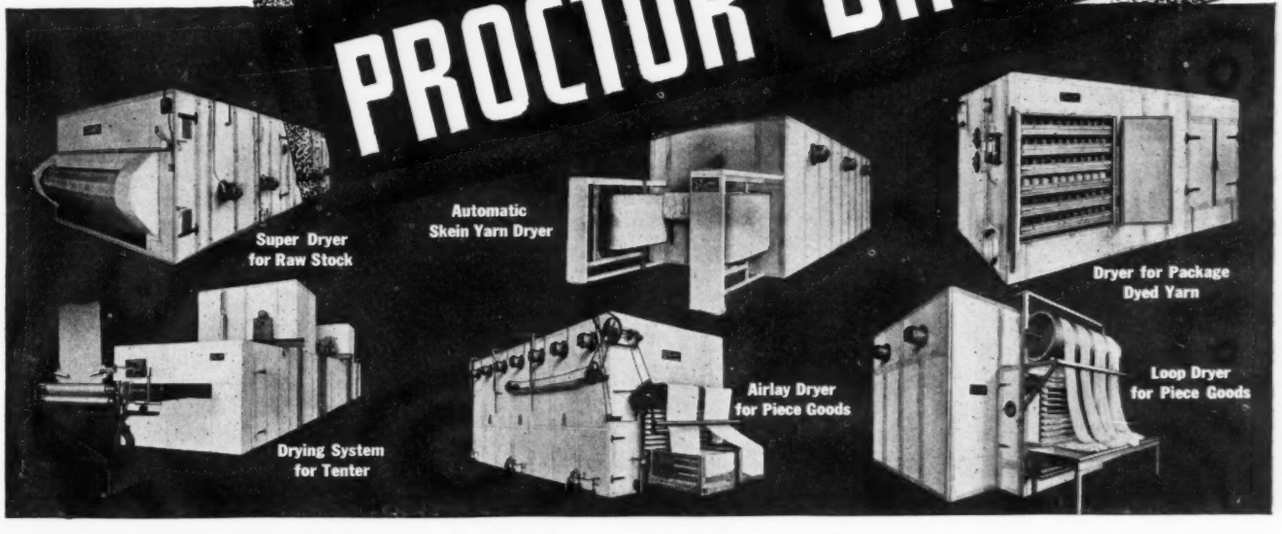
Here's To BETTER PROFITS In 1939

Right now, many textile firms are taking steps to assure themselves better earnings in 1939. They are increasing the spread between cost and selling price by greatly lowering their production costs. This is being accomplished by modernizing the equipment in their dry rooms. In some cases drying costs have been cut as much as 50% by replacing old drying equipment with the newest Proctor Dryers. Proctor engineers have created completely new types of drying machinery in the past few years, and have made important improvements in existing types . . . bringing large savings in time, steam, power, labor and floor space, as well as considerably improved quality of the finished product.

We suggest that you, too, adopt this plan for better profits in '39. Let us find out for you what savings could be made in your plant by modernizing your drying department. There will be no obligation on your part, of course.

PROCTOR & SCHWARTZ • INC • PHILADELPHIA

NEW PROCTOR DRYERS


Super Dryer for Raw Stock
Automatic Skein Yarn Dryer
Dryer for Package Dyed Yarn
Drying System for Tenter
Airlay Dryer for Piece Goods
Loop Dryer for Piece Goods

Steel Heddle 40 Years Old

Established in 1898, the Steel Heddle Mfg. Company has just completed 40 years of service to the textile industry. It was started in a small shop in Germantown, Pa.; now has four plants located in Philadelphia, Greenville, S. C., Atlanta, Ga., and Montreal, Canada.

◆

New Machinery for Gastonia Brush Co.

Gastonia Brush Co., Gastonia, N. C., recently completed installation of new machinery of the latest type for the manufacture of textile brushes, replacing obsolete equipment.

◆

H. & B. Buys Interest in Industrial Machine Corp.

H. & B. American Machine Co., Pawtucket, R. I., recently acquired an interest in the Industrial Machine Corp., 1450 Broadway, New York City, which controls the patents on Federal throwing machines for silk and rayon. These machines double, twist and cone in one continuous operation, to produce labor saving and eliminate investment in single purpose doubling and coning equipment. H. & B., with their extensive factory space, modern machine tools, engineering experience and technical staff, plan greatly to simplify manufacturing and service problems on these machines. Sales headquarters for Federal machines will continue at the New York office of Industrial Machine Corp.

◆

Hinde & Dauch to Build New Detroit Factory

The Hinde & Dauch Paper Company have plans to erect a modern corrugated box factory in Detroit, Mich., it is announced by Sidney Frohman, president and general manager. Charles U. Harvey, who has represented the company in Detroit for over 15 years, will be in charge as district manager for Michigan. This will provide the company with plants in 15 cities, the others being in Baltimore, Boston, Buffalo, Chicago, Cleveland, Gloucester, N. J., Hoboken, Kansas City, Muncie, Richmond, Sandusky, St. Louis, Montreal and Toronto.

◆

Norman Griffith with New Tag Concern

Dixie Tag & Envelope Co., Charlotte, N. C., is a new firm manufacturing tags for the textile, cotton, dyeing and finishing industries. Allen Folk, formerly vice-president and manager of Mid-West Tag Co., St. Louis, is executive head of the company, which has offices and plant at 220 East 4th St., Charlotte.

Norman E. Griffith, formerly southern manager of Kaumagraph Co., and well known throughout the southern textile industry, has been made southern manager for the Dixie Tag & Envelope Co. James L. Staten, Jr., represents the company in the city of Charlotte.

◆

Crane Co. Research

Research work which goes on behind the scenes in the plant of a large manufacturer of valves, fittings, plumbing and heating equipment and pumps was revealed at an open house held by Crane Co., at its Chicago Works in the middle of November. The occasion was inspired by a notable expansion in the Crane research and engineering program.

Although research work has been a apart of the Crane program for half a century it has been continually enlarged in recent years until today it occupies two two-story buildings with a total floor space of 86,000 square feet and a personnel of 285. The staff ranges all the way from experts in metallurgy to specialists in the field of ceramics—a body of engineers spending their entire time in the work of controlling the quality of present products and looking ahead to their improvement.

As Charles B. Nolte, president of Crane Co., says in the foreword to a book on the Crane Research Laboratories, "Crane Co. is dedicated to the philosophy that only through continuing a well-organized program of research can it best serve its employees, its stockholders, the users of its products and society in general."

◆

Viscose Announces New Staple Fiber Plant

The American Viscose Corporation has announced that its staple fiber plant at Nitro, W. Va., has completed installation of all production machinery and is now working at full capacity. This plant, which is the only plant in the United States built exclusively for rayon staple fiber, represents an investment of approximately $5,000,000. The production is at the rate of 20,000,000 pounds annually, which together with the Parkersburg staple production, brings the annual total to 25,000,000 pounds. Referring to the recent announcement of a new staple fiber plant at Nitro, the company announces that construction for the new plant actually started in September and that it will be in operation by early summer of 1939. When the new unit is completed it will represent an investment of about $10,000,000 and will bring the company's total production of staple fiber to 50,000,000 pounds annually.

Changes in Personnel at American Viscose

William B. Olmsted has been made sales manager of Lustre Fibres, Ltd., selling agents for American Viscose Corp. Mr. Olmsted has been associated with American Viscose for about eight years. Harry C. Neren has been made general manager of the 7 plants of American Viscose. He has been manager of the Roanoke plant for 21 years and is succeeded there by Leroy H. Smith, formerly plant chemist; W. A. Barton remains as assistant manager at Roanoke. Mr. Neren, with headquarters in Roanoke, will have charge also of the Marcus Hook, Lewiston, Meadville, Parkersburg and Nitro plants of the company. George M. Allen, formerly assistant manager at Roanoke, is now assistant plant manager of all plants. Frank H. Griffin, formerly vice-president, is now technical director of the company; William H. Brown has been made secretary; Hobart O. Davidson, chief engineer, and Harry Crewdson, chief operating engineer.

◆

Publication Started on Warp Sizing Reports

Publication of the 17 progress reports of the recently completed research on the warp sizing of filament viscose rayon and its sizing materials is started in the December issue of *Textile Research* the official organ of U. S. Institute for Textile Research. The subject of this first report is "Viscosity of Starch Pastes". This is the first of the Institute's co-operatively financed studies to be completed, it having been in progress since the summer of 1935. It was financed on a 50-50 basis by The Textile Foundation and a group of Institute members. A total of $20,000 was expended in the work, exclusive of donated materials and services. There has been no previous publication of the research findings, because all progress reports of the Institute's co-operatively financed studies are confidential for at least a year to subscribers.

At the request of members who were co-operators in the first study, and of an open conference held in New York in November, the Institute is undertaking the organization and financing of a new research: the warp sizing of cotton and spun rayon. This will be conducted in a southern laboratory and in southern mills, and administered by a committee of southern men. The recently completed study of sizing was conducted at Massachusetts Institute of Technology with some experimental work in New England mills.

The conference papers and discussion are reported in the December issue.

FIRST STEP IN LIGHT CONDITIONING YOUR PLANT

Ceilings and Walls *painted* with Light-reflecting *Save-Lite* . . .

Better light, better sight...better work, fewer errors, lower production costs—that's an axiom in modern plant management. And the first step to better light...perfect light conditioning...is ceilings and walls painted with lastingly white Sherwin-Williams Save-lite.

Whatever your work...however you do it...you'll find a Save-lite specially formulated to stand up, keep its high light reflecting whiteness under the most "difficult" conditions prevailing in your plant. Let the Sherwin-Williams painting engineer make a survey of your buildings. He'll tell you exactly which kind of Save-lite you need and where you need it. No obligation. Or write for the Sherwin-Williams "Plant Conditioning Report". It is free. Address The Sherwin-Williams Company, Cleveland, Ohio and all principal cities.

COVER THE EARTH

SEE THE SHERWIN-WILLIAMS PAINTING ENGINEER

SHERWIN-WILLIAMS SAVE-LITE

THE PLANT CONDITIONING PAINT

Home-Study Course in Textiles

The Textile Academy, 350 Broadway, New York City, have announced a low-cost, home-study course in textiles, including fiber identification, fabric analysis, and fabric identification, and covering cotton, rayon, wool, silk, etc. The Academy has, from its inception, looked upon the educational movement in the textile industry as a co-operative undertaking with leading graduates of textile institutes and colleges constituting the faculty.

◆

November Rayon Shipments Total 21,000,000 Pounds

For the first time in the history of the rayon industry, figures are now available showing actual shipments to consumers and stocks on hand at the close of each month in pounds. The figures appear monthly in the *Rayon Organon*, published by the Textile Economics Bureau, Inc.

November shipments of rayon filament yarn to domestic consumers aggregated 21,000,000 pounds or substantially more than double the 9,400,000 pounds shipments in November, 1937. Compared with October, however, there was a reduction from the 24,500,000 pounds shipped during that month, which was not surprising due to the three holidays in November and also the more popular demand for finer denier yarns, which also reduces poundage.

Stocks of rayon yarn held by domestic producers amounted to 39,700,000 pounds on November 30 against 35,800,000 pounds on October 31.

"It will be realized," states the *Organon*, "that, with the increasing variety of deniers, filament counts, lusters, and types of rayon yarn offered by producers, these November stocks cannot be called unwieldy. In fact, there still are definite inventory shortages today in some of the more popular yarns."

Rayon consumption and stocks on hand at the close of each month given, follows:

	Consumption	Stocks on Hand
November, 1938 ...	21,000,000	39,700,000
October, 1938	24,500,000	35,800,000
November, 1937 ...	9,400,000	44,500,000

Due to continued activity in rayon demand, consumption for 1938 is expected to exceed the total for 1937 despite the slow business of the early months of this year. Rayon shipments for the eleven months of 1938 aggregated 250,000,000 pounds and thus are essentially equal to the 257,000,000 pounds shipped during the same period of 1937. "The outlook for December shipments this year is substantially brighter than in December, 1937," states the publication.

What the Southern Mills are Doing

Mooresville Cotton Mills, Mooresville N. C., have completed a general modernization of the opening, picking and carding departments. New opening and cleaning machines, and one-process picking, have been installed.

Rock Hill Printing & Finishing Co., Rock Hill, S. C., have acquired from Cutter Mfg. Co., three blocks of property for additional expansion. The additions will provide employment for 200 additional workers. The plant now processes more than 200,000,000 yards of cloth annually.

Beacon Mfg. Co., Swannanoa, N. C., are erecting a new building and an addition to an existing unit.

Galax Weaving Company, Galax, Va., has installed 20 additional looms for weaving rayon.

C. L. Upchurch & Sons, Athens, Ga., who acquired the Eureka Cotton Mills, Englewood, Tenn., have announced plans for putting the plant in operation, in charge of C. B. Walls.

A $25,000 grammar school building has been completed at Mills Mill No. 2, Woodruff, S. C., containing 7 class rooms, 4 storage rooms, and an auditorium with a seating capacity of 500.

Russell Mfg. Company, Alexander City, Ala., is changing over 40,000 spindles with Saco-Lowell long draft equipment.

Cannon Mills, Kannapolis, N. C., recently placed order with Saco-Lowell Shops involving approximately 205,000 spindles of long draft spinning. When this equipment is installed, all Cannon units will be completely equipped with long draft spinning, it is stated.

Additional Personal and Obituary Notes

(*Other items appear on page* 80.)

HUGH OWENS has been promoted to assistant superintendent at Cowikee Mills, Union Springs, Ala. He was formerly at the company's plant at Eufaula.

ERNEST REES, president of Elk Cotton Mills, Fayetteville, Tenn., has been elected chairman of the Carded Yarn Group.

D. B. WORSHAM has been promoted to overseer of weaving at the Santee Mills, Bamberg, S. C.

ROBERT FOLKMAN, formerly superintendent at Nebel Knitting Co., Charlotte, N. C., has become connected with the Hugh Grey Mills, Concord, N. C. E. CUTHBERTSON is superintendent at Nebel.

Obituary

DAVID R. COKER, Hartsville, S. C., the outstanding figure in southern cotton cultivation and plant breeding, passed away on November 28, at his home in Hartsville, following a heart attack. Mr. Coker was 68 years of age.

ISAAC T. PROSSER, for many years, until his recent retirement, agent of the Chicopee Mfg. Corp., Chicopee Falls, Mass., passed away on November 29.

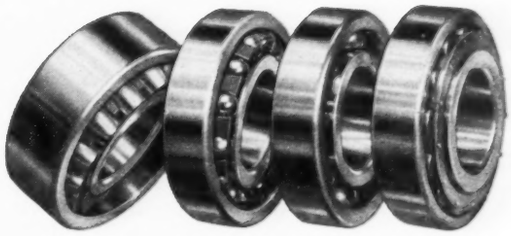
C. L. GILBERT, sales representative of the Clinton (Iowa) Company, died in November at 62 years of age. Prior to his Clinton connection, Mr. Gilbert had been superintendent of the Darlington (S. C.) Mfg. Co. for more than 15 years.

ARTHUR I. HARVEY, for many years agent of the Universal Winding Co., Providence, R. I., and more recently sales representative for the company in New England, passed away on December 5 following a short illness.

HARRY F. MARSHALL, 69, sales engineer for the James Hunter Machine Co., North Adams, Mass., passed away on November 16. Mr. Marshall would have completed 40 years of service with his company on December 28.

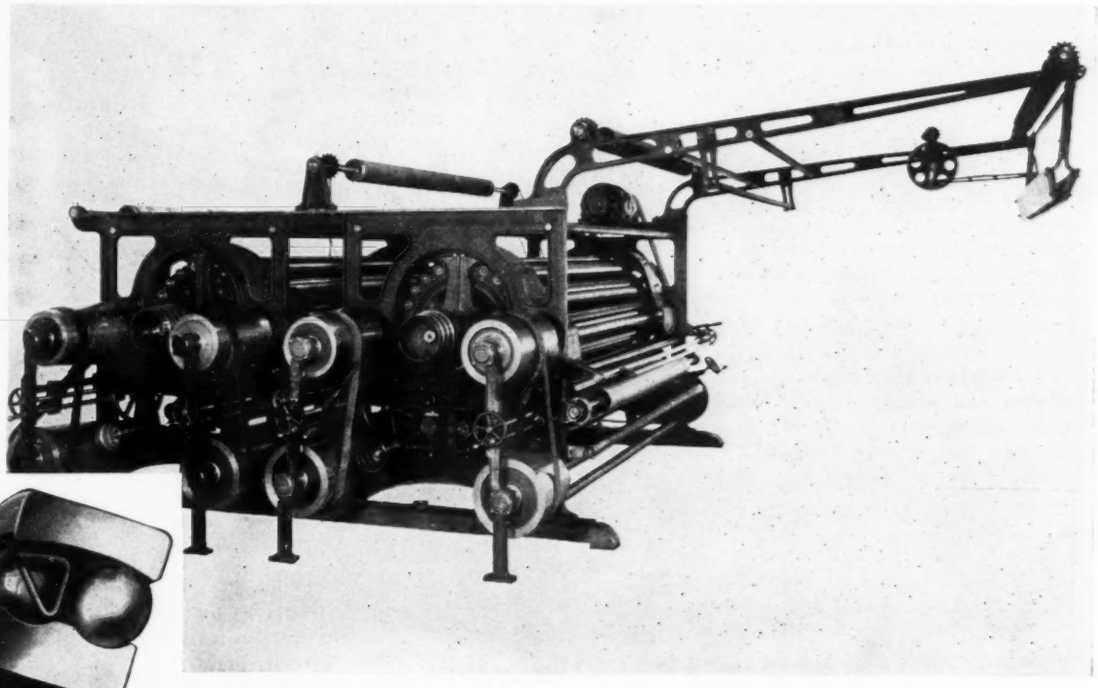
CARL C. GRAY, for the past several years manager of the Atlanta office of the B. F. Sturtevant Co., Hyde Park, Boston, Mass., and formerly advertising manager of the company, died recently at his home in Houlton, Maine, after an illness of several months.

G. E. PARMENTER, president of the American Crayon Co., Sandusky, Ohio, died at his home in Branford, Conn., on November 11, at 77 years of age. He was the father of G. I. PARMENTER, superintendent of Goodyear Clearwater Mills, Atco, Ga.

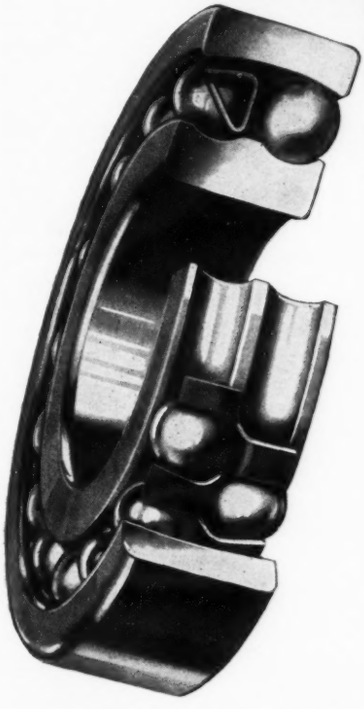


MORE THAN

27 YEARS OF SKF PERFORMANCE ON WOONSOCKET NAPPING MACHINES



● *146 SKF Ball Bearings. 16 SKF Housings and 16 SKF Covers are used on this 2-Cylinder Double Action Napping Machine built by Woonsocket Napping Machinery Company.*



OVER 43,000 SKF BALL BEARINGS PURCHASED, LESS THAN 100 REPLACED

● For more than 27 years, Woonsocket have used SKF Ball Bearings. They have used *over 43,000* of them, yet have replaced *less than 100.*

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That they *continue* to select SKF Bearings for as long a time as Woonsocket is a great tribute to SKF's design, specially processed steels and precision workmanship. If you use SKF Bearings *once*, you'll use them *always.*

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PERSONAL NOTES
about Men You Know

LLOYD H. RICE has resigned as general superintendent of Alabama Mills, Inc., with headquarters in Birmingham, Ala., to become general manager of Opelika Mills, Inc., Opelika, Ala., succeeding ARTHUR S. THOMAS, who has become general superintendent of Werthan Bag Co., Nashville, Tenn.

FRANK S. DENNIS has become general superintendent of Sibley-Enterprise Mills, Augusta, Ga., succeeding D. R. SENN, resigned. Mr. Dennis was formerly connected with the Shuford Mills, Hickory and Granite Falls, N. C.

H. H. SPRAY has been promoted to superintendent of Jefferson Mill No. 2, Crawford, Ga. He was formerly overseer of carding at Jefferson Mill No. 1, Jefferson, Ga., where he is succeeded by E. A. JOHNSTON, of Selma, Ala.

JAMES OATES has become overseer of carding and spinning at the Santee Mills, Bamberg, S. C. He was formerly overseer of spinning at the Sibley plant, Sibley-Enterprise Mills, Augusta, Ga.

ALAN B. SIBLEY, of Darlington (S. C.) Mfg. Co. and Hartsville (S. C.) Cotton Mills, has been elected treasurer and director of Judson Mills, Greenville, S. C., of which D. W. ANDERSON is president. Mr. Sibley succeeds JOHN KILLARS, JR., who will spend more time in New York in connection with his work for Deering, Milliken & Co.

CHARLES HAMPP has succeeded ALBERT DONST, resigned, as superintendent of the Alamac Hosiery Co., Inc., Reidsville, N. C.

W. K. DANA, superintendent of Laurens (S. C.) Cotton Mills, has resigned, and will make a tour of South America. CHARLES D. GREEN, superintendent, Mills Mill, Woodruff, S. C., has been elected general manager of Laurens Cotton Mills, a new position. He is succeeded at Mills Mill by R. G. GILLESPIE, in charge of the office, and J. E. REEVES, in charge of the mill.

B. F. UNDERWOOD, superintendent of Piedmont (S. C.) Mfg. Co., has been transferred to the superintendency of Easley Mill No. 1, at Easley, S. C., and V. J. LIPSCOMB, who has been superintendent at Easley, has succeeded Mr. Underwood at Piedmont.

R. E. CAFFRAY has been made general superintendent of Pacific Mills' print works, Lawrence, Mass., succeeding A. E. HIRST, resigned. Mr. Caffray has been superintendent for a number of years.

PEYTON ROWAN, formerly manager of the Anniston (Ala.) Yarn Mills, has been made general manager of the Profile Cotton Mills, Jacksonville, Ala., succeeding W. P. HAZLEWOOD, who now is manager of the Pickett Cotton Mills, High Point, N. C.

D. WILLS HUNTER, who has been made executive vice-president of the Mansfield and Jennings Cotton Mills, Lumberton, N. C., in charge of a new modernization program, including installation of new equipment, will continue also as president of the Arcade Cotton Mills, Rock Hill, S. C.

J. C. J. STRAHAN, for many years an executive in Pennsylvania hosiery mills, is manager of the new Green Cove Full-Fashioned Hosiery Mills, at Green Cove Springs, Fla.

CLAUDE KICHLEIN is superintendent of the new full-fashioned hosiery plant recently completed at East Flat Rock, N. C., by Chipman, Inc.

A. L. LARKIN has become overseer of carding at the Bradford Mills, Prattville, Ala.

W. H. DARBY, formerly overseer of spinning and carding at Bibb Mfg. Co. Mill No. 2, Macon, Ga., is now general overseer of spinning and carding at the Kenneth Mills, Walhalla, S. C.

JESSE M. JACKSON has been promoted to overseer of the cloth room at the Columbus (Ga.) Manufacturing Company, succeeding G. C. WELCH, resigned.

JOSEPH GOETZ has become assistant superintendent of the Fitchburg Yarn Company, Fitchburg, Mass. He was formerly overseer of carding and spinning at Slater Mills, Webster, Mass., and more recently has held a similar position at the Watatic Spinning Mills, Fitchburg.

W. H. SPENCER, JR., formerly connected with the Kendall Co. at Newberry, S. C., has become overseer of weaving at the Whitney (S. C.) Mfg. Co.

LUTHER W. ARMSTRONG, graduate of Alabama Polytechnic Institute in 1938, has become connected with the water and textile waste department of J. E. Sirrine & Co., Greenville, S. C.

STANCIL JONES has been made superintendent of finishing at the Pasquotank Hosiery Mills, Elizabeth City, N C.

JAMES L. MCINTYRE has become associated with the Charlotte dyestuff laboratory of American Aniline Products, Inc. He was graduated in textile engineering from Alabama Polytechnic Institute in 1938.

DWIGHT PHILLIPS has resigned his position at Appleton Co., Anderson, S. C., to accept a position with the Bradshaw Loom Reed Works, Cayce, S. C., where he will be assistant to HOWARD BRADSHAW, owner, and devote a part of his time to reed work.

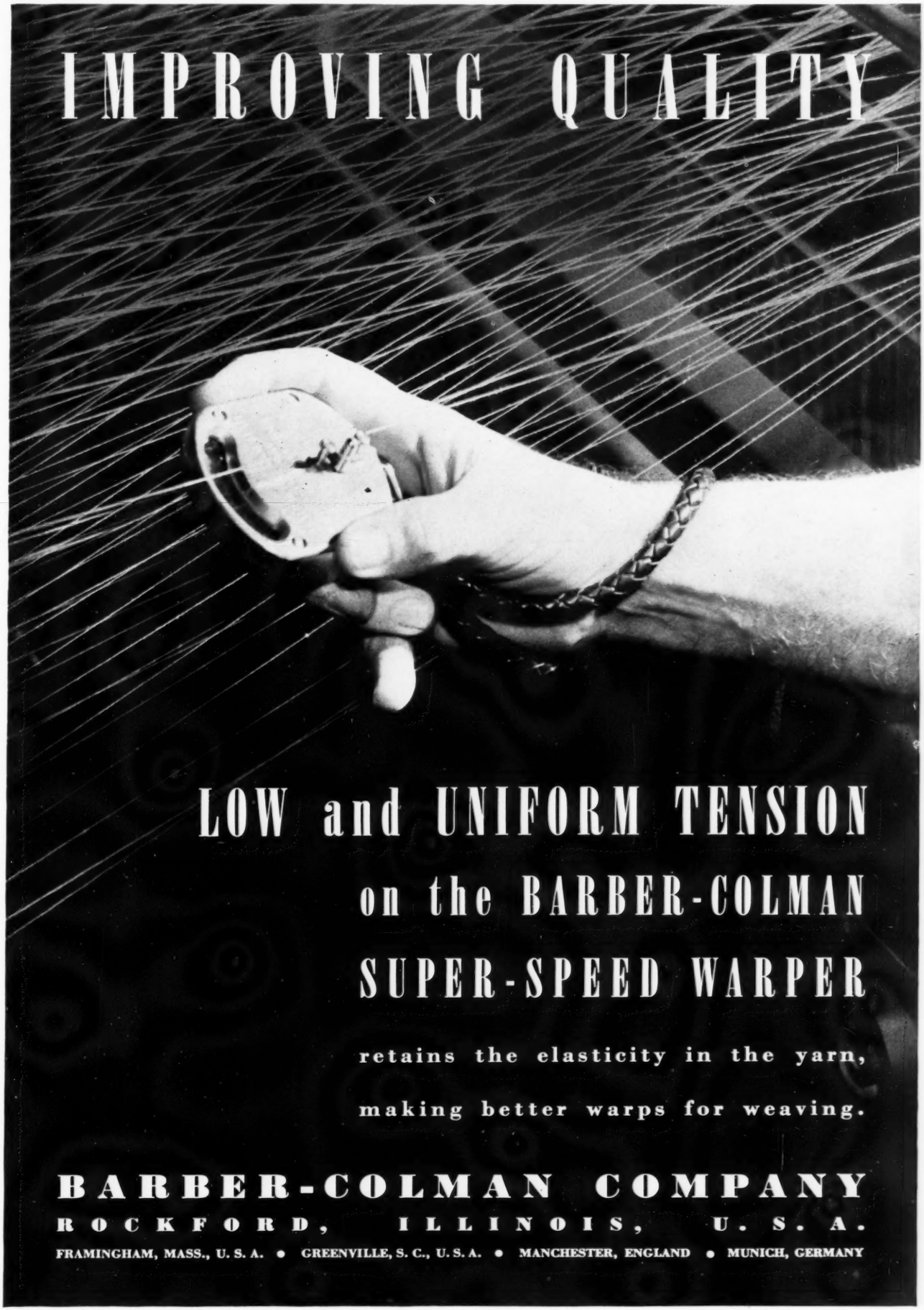
G. P. CARMICHAEL and S. R. FLOYD have resigned their positions as office manager and production manager, respectively, of the Steel Heddle Mfg. Company's plant in Atlanta, Ga. (formerly Atlanta Harness & Reed Mfg. Co.)

W. A. TIPTON, manager of packing sales of the mechanical goods division, U. S. Rubber Products, Inc., was recently appointed a director of the rubber division of the Mechanical Packing Association.

W. J. STILL, for the past five years superintendent of the American Spinning Co. plant of Florence Mills, Greenville, S. C., has been made vice-president and manager of Borden Mills, Inc., Kingsport, Tenn., assuming his new duties January 1. The Borden plant was formerly in charge of GEORGE H. HUGHES as superintendent; Mr. Hughes having retired from active service. Mr. Still is the son of B. L. STILL, of Lancaster, S. C.; his brothers are C. L. STILL, general manager of the Fort Mill (S. C.) plant of Springs Cotton Mills, and FRED L. STILL, superintendent, Mathews Cotton Mills, Greenwood, S. C.

W. S. NICHOLSON, treasurer of Excelsior Mills, Union, S. C., has been named also treasurer and general manager of Darlington (S. C.) Mfg. Co., succeeding ALAN B. SIBLEY who is now treasurer of Judson Mills, Greenville, S. C.

(Additional personal and obituary items on page 78.)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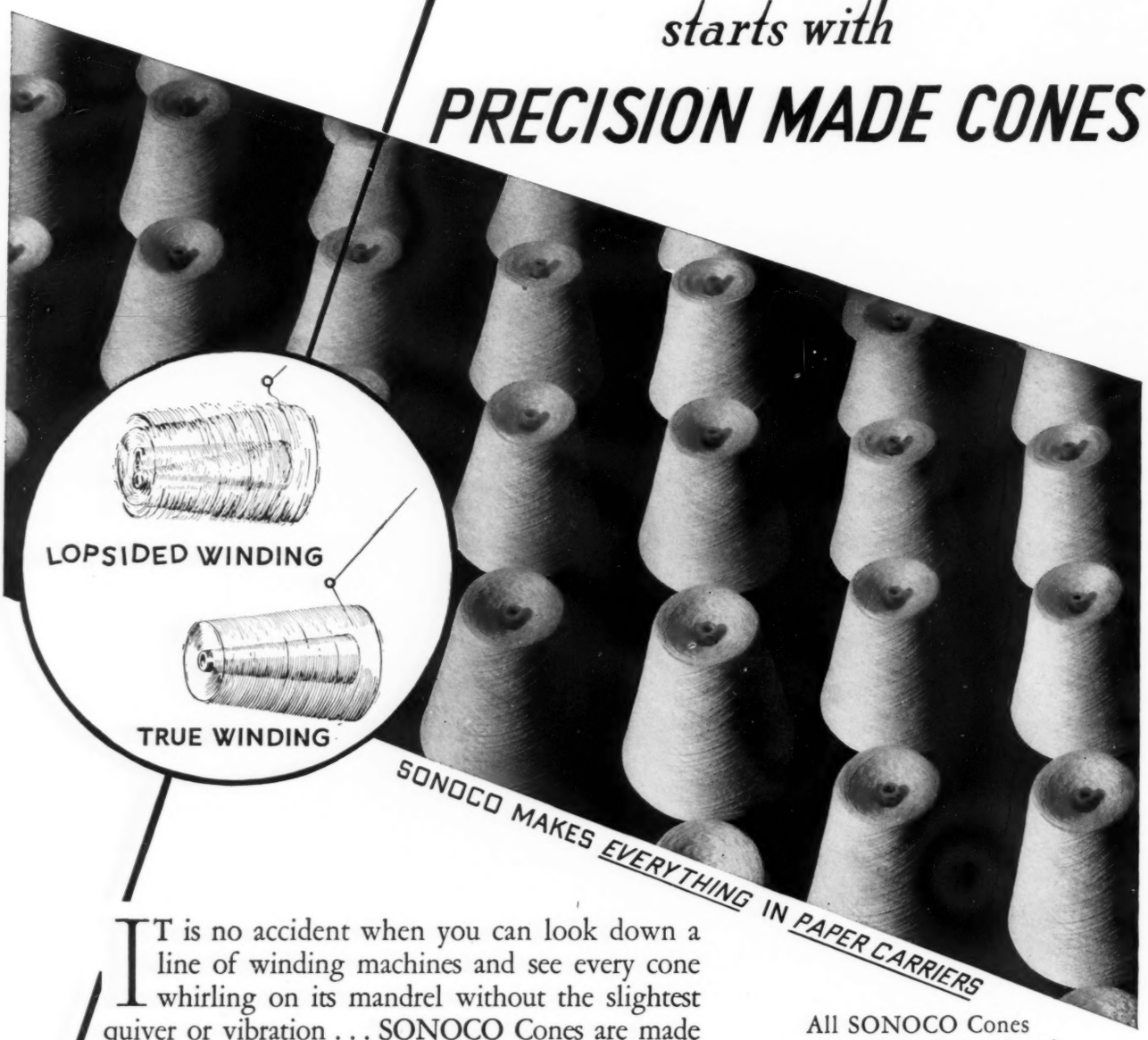

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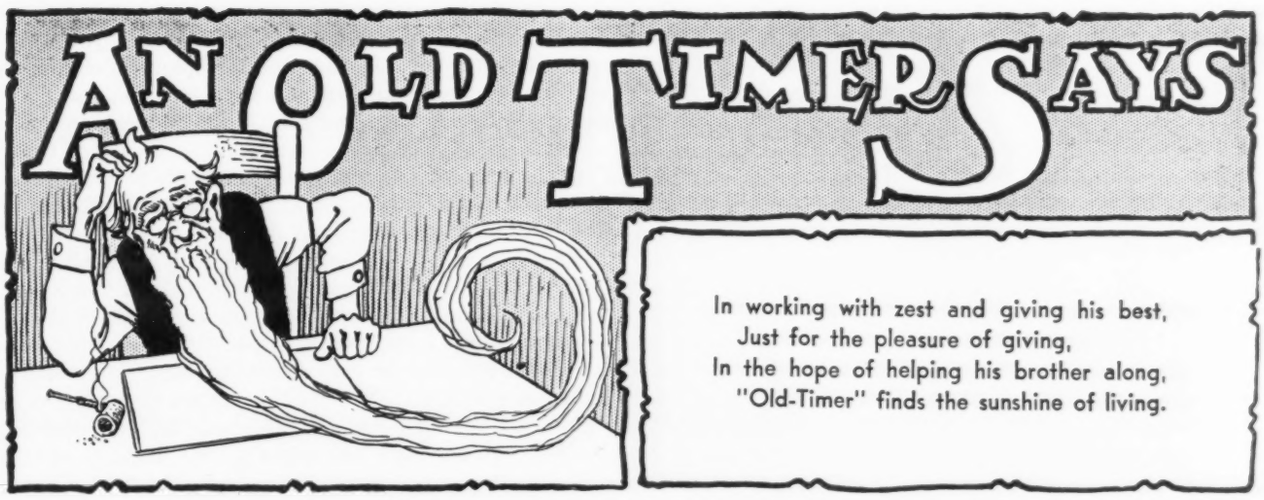
AN OLD TIMER SAYS
In working with zest and giving his best,
Just for the pleasure of giving,
In the hope of helping his brother along,
"Old-Timer" finds the sunshine of living.

Resolutions of 1939

YES, a lot of people make New Year's resolutions and that same lot of people will tell you that darn few such resolutions ever amount to anything. That is, so very, very few people keep them. As a matter of fact, the people making these resolutions do not give the matter very much thought *before* making these resolutions. If they did, if they really made up their minds definitely, then possibly more of the resolutions would be kept. Of course, most every fellow makes his resolutions in good faith, so to speak, but the heck of it is he does not give the matter the concentrated thought that he should and therefore runs into so many situations which he has not anticipated that he soon gives up in disgust, drops the whole matter from his mind, and falls back into the line of least resistance.

This resolution business is a much more important part of every overseer's and superintendent's life than anyone will give it credit for being, unless you get right down to brass tacks and begin to analyze the matter in detail. For example, you, the reader of this OLD-TIMER page, please stop and think back over the years of your business life—think of some of those resolutions you made—not necessarily the ones made on January 1 of any year, but resolutions you made concerning your work, your personal habits, your finances, etc., at any time during the year. Do you remember the numerous things you resolved faithfully to do if you ever succeeded in being promoted to an overseer's job? And you did start off on that first overseer's job to carrying those ideas out, didn't you. Now just picture in your own mind *how much better* an overseer you would have made if you had had the backbone to have carried those resolutions right along through all of those years. How about it? Has OLD-TIMER got your number or not—just answer that question honestly to yourself.

And during the years you were overseer, can you remember, yes of course you can, all of those wonderful things you were going to do when you got to be a superintendent? Don't you remember how you thought in your own mind how you could just beat the "old man" (your superintendent) in the way he did things, and you made a solemn resolution that you would never do things that way—in fact you could not quite figure out how he held his job—it looked like the president would know he could hire a much better man for even less than he was paying the old man. Now, OLD-TIMER is just wondering what *your* overseers think about you, and, Mr. Overseer, that same reasoning applies to you—what are your section men and second hands thinking about *you*? Oh, if you had just lived up to those resolutions you made—well, without running too much risk of losing a bet, OLD-TIMER would bet you two to one that you would be pulling down a larger salary today if you had kept most of those resolutions.

All of this reasoning was prompted by a conversation OLD-TIMER had today with his editor. Sitting in the editor's office, and talking about overseers and superintendents in general, OLD-TIMER made the remark that the biggest *one fault* he had observed with practically all of the overseers and superintendents he has come in contact with in all the years of his experience is that *"they do not run their jobs like they* KNOW *those jobs should be run."*

"How's that, OLD-TIMER?" says Mr. Editor.

"Yes, I know that statement does sound rather foolish, Mr. Editor, but I just came from a mill yesterday where there is a young man in charge as superintendent who I know from being in his mill and coming in close touch with his work is not doing many of the things that he *knows* he should be doing to run the job the way he *knows* it should be run. Although this young superintendent is getting along nicely, has made considerable improvement in the physical condition of the mill since he took charge, and has produced a better spirit of co-operation among the operatives, is well liked by both employer and employees, OLD-TIMER happens to know the training the young superintendent has had because he once worked for OLD-TIMER and therefore OLD-TIMER is not just guessing or theorizing when he states that this same young man could make still *further* improvements in that mill if he (the young superintendent) would do the things he knows he should do."

This case is typical of the vast majority of over-

seers and superintendents throughout the textile industry.

Fellows, it is the one *biggest* fault we all have, and if you will make an honest study of your own case you will find that here is an opportunity for you to make a 1939 resolution which will put more dollars in your pocket than all the resolutions you have ever made before during your whole business life: Resolved: *I will hereafter run my job like I know it should be run.* That is, I will do the things that I know I should do personally. I will inspect my weaving by walking through the weavers' alleys, sometimes taking the overseer along with me. I will decide before starting such inspection on some one item of loom-fixing that I am going to look for especially on this trip, such as the setting of the harnesses, or the power on the picker sticks, or the stop motions, or batteries or temples, and as I go along I will look at the cloth being made on each loom, the condition of the selvages, and look for doubles, misdraws, etc. I will set down the date and the item I specialized in when I get back to my office and the next time I will select another item to specialize in and make a record of that.

You see, fellows, in a year or less you can look at that record and tell just when you looked over shuttles or any other item, and incidentally, your weave room will begin to improve in efficiency.

"Oh, I haven't got the time," I hear you say. Yeah, that brings to mind another remark OLD-TIMER made which the editor thought sounded a little "screwy". He returned from quite an extended trip and blurted out that most of the overseers and superintendents he had seen on that trip were too darn busy to run their jobs. You fellows might think that one over, too, if you have never tried to analyze such a statement.

Now suppose you go in the weave room tomorrow and time yourself to see how long it will take you to look over 300 looms or 500 looms, inspecting one item as suggested. OLD-TIMER thinks you have a little surprise waiting for you. Now decide for yourself whether you could spare that much time once a week for your weaving department, and by dividing 300 or 500 looms (which you have just inspected) into your total looms you will see how many weeks it will take you to get over the job. You should get over a mill of 2000 to 2500 looms once a month, and larger mills in proportion.

Does your overseer make such an inspection of so many looms daily? Well, Mr. Overseer, you had better start tomorrow. Now by the time you have inspected your entire weave room two or three times, sit down and think back over the things you saw or did which you had no idea of seeing or doing when you started the inspection. Did any weaver speak to you or did you speak to any weaver or section man? Well, it will certainly do no harm if you stop to ask Mr. or Mrs. Weaver how his or her work was running—how much she made last week, or some other inquiry. Some of your weavers know some things about your weave room that you do not know. I mean some things that will help you improve production or costs or seconds or supplies.

How many wobbly spindles per side or frame did you find on your first spinning room inspection? How many weight levers did you point out to the overseer or section man as needing adjustment? How many neb bars (top roll bearings or guides) did you find loose, allowing top rolls to be too far apart. You know, section men are afraid to pull very hard on the nuts when setting top rolls because the links break so easily—how many—Oh! well, heck, what's the use of OLD-TIMER mentioning so many items. Suppose *you* get in there and find some of the things which need attention and then by "Doggone it" give them attention. Can't you spend *one hour* per week of your valuable time in the spinning room to do the things you know should be done? Just *one hour,* understand; matters not how many spindles you have, that *one hour* per week will get you around sometime, and that's more than you are doing now. Is that a fact or not?

Since when have you, Mr. Overseer or Mr. Superintendent, had the man who takes up the waste from the cards, pull the waste out from under each card and come for you to look at it? And do you know you can look over 400 cards in 10 minutes? Well, if you haven't that many cards, can you spare five minutes of your valuable time to look over what cards you have, say, once a month? You may have a card that is not taking out *enough* waste, and of course you know that is worse than a card which is taking out *too much,* or do you?

Although January 1, 1939 is past, don't let that stop you from making the most important resolution you ever made in your life: *"I will hereafter run my job like I know it should be run."*

Just in case some young overseer or superintendent who reads this page needs a little prompting along the lines suggested in this article, that is, to give him ideas about the items he should look for in the inspection of his machinery—carding, spinning, weaving, or cloth room—drop a note to the editor and he will refer you to a number of OLD-TIMER articles which give more details concerning the inspection of machinery that every overseer and superintendent should be doing systematically.

Finger "Just Nipped"

The other day an experienced girl operating trimming machine narrowly missed losing the end of her right index finger. Luckily, the finger was "just nipped" and a visit to the first aid room was all that was necessary.

But the foreman was much concerned. He had been preaching safety vigorously for years and this girl was one of his most dependable operators.

"I don't know why I did such a foolish thing as to leave my finger in the way of the machine," she explained, "but I've been just so upset all day that I hardly knew which end I was standing on. I was up all last night with my mother, who is very sick. The doctor said she must go right to the hospital for an operation, but we have no money to stand such an expense and I've just been fretting all day wondering what we could ever do!"

When she told her foreman about this difficult home situation, he immediately understood how the accident had happened. Her mind just was not on her job. How could it be with such family problems troubling her?

The foreman took her to the superintendent's office where arrangements were made to advance money for her mother's hospital bill, with repayment by small weekly deductions from her wages.

—"Management Information", Elliott Service Co., Inc.

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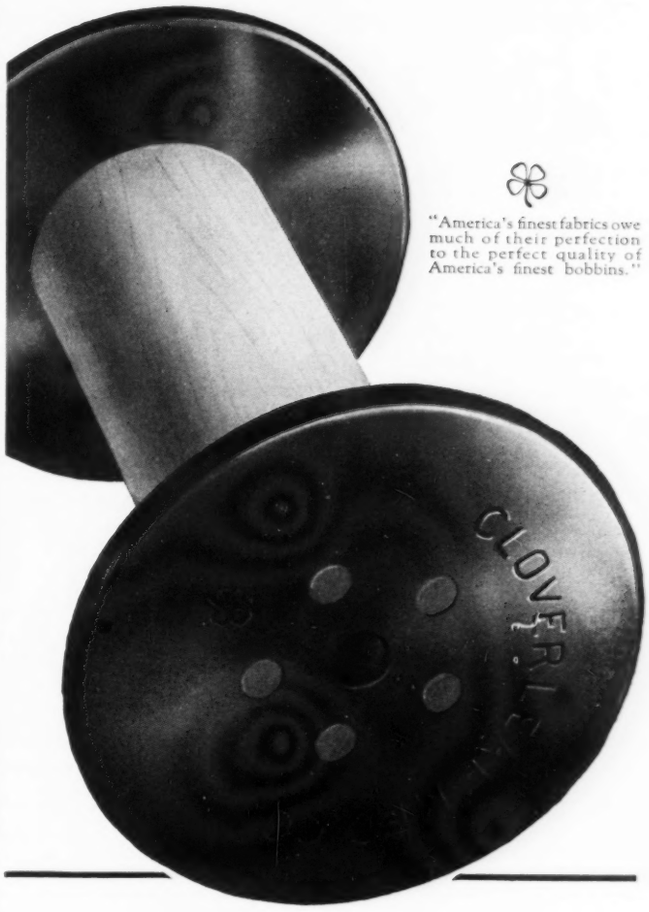

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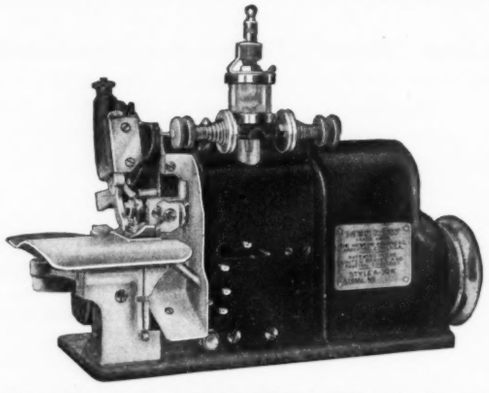

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HOW OTHER MEN MANAGE

Research and Progress

EDITOR COTTON:

I have read with a great deal of interest the article by "WASH (R. I.)", appearing on page 95 of the March 1938 issue of COTTON, in which he, in turn, replies to my letter, on page 105 of the September 1937 issue. Of course I expected "WASH" to come back, in fact,I believe I so stated in my article, but I hardly expected him to criticize it so thoroughly.

I cannot claim to have had anything like the experience that our friend "WASH" has had. I am a few years younger than he is. The writer is not a superintendent, but I will say that I am not employed in the research department, but that my job is a supervisory one inside the mill.

From the statement by "WASH" in the seventh paragraph of his article, it would seem his ideas of a research department and mine do not coincide. He says, "As I understand it, the duties of a research department are to measure output, estimate production, and correct all defects, and they should be judged solely on this basis". Now by basing his arguments on this statement I would have very little comeback, for I thought the research department existed for entirely different reasons.

In writing the article that was criticized by "WASH", I had in mind that research means a very careful inquiry, or investigation; to quote one authority, the word research means: "laborious, careful inquiry or investigation". In our mill it is customary for the production manager to handle various features relating to the production, basing his figures on the productive capacity of the different departments and upon the orders on hand. So it can readily be seen that "WASH" and this writer are talking about entirely different things, so we can hardly have any quarrel.

As to his other reason for the existence of the research department, ". . . and correct all defects", of course we will agree that looking for the reasons for defects should be one of the main objects of research, though I would not say that the research department should be charged with the responsibility for the correction of *all* defects. That would be a big order indeed!

It was my understanding that research comes under the jurisdiction of the laboratory, and that the chief technician, or whatever the director of the laboratory is called, supervises all research work at the mill. In this connection it is my contention that you need a man of the right caliber to head such a department. If possible he should have a textile school education, but above all he should be a man of practical experience, with good, common sense, and a man who will be thorough in anything that he undertakes to do. Perhaps he will have some understudies who are just out of textile school, but he should supervise all of their tests and pass upon all their findings in the light of his mature judgment.

With a personnel, such as has just been outlined, not every mill could afford a research department. In fact, even in the case of some of the larger mills a number of them might have to go in together to support such a research laboratory. But when we consider that they do the regular testing for the mills, as well as the research work, we can see that such a project is an investment.

Research of necessity involves a lot of detail work. Sometimes a series of tests must be made, covering a period of days, weeks, and even months. I still ask, "Does the superintendent, the overseer or the second-hand have time to make tests and experiments of this kind?" I hardly think so, and if they took time to engage in many projects of this sort their regular routine work would be so badly neglected that somebody would probably find himself out of a job.

Possibly most of the research work connected with the textile industry should be undertaken under the direction of the Textile Foundation, the Cotton-Textile Institute, or the American Society for Testing Material. But even so, many of the actual tests and experiments will have to be made by the co-operating mills under actual working conditions, so after all at least some of the mills will have to employ someone to conduct these tests.

Our friend, "WASH", cited some interesting figures and historical facts to prove his contention that cotton mills do not need to engage in research work. Perhaps he is right, but let us look for a moment at the industrial picture as a whole. Were the automobile, the airplane, the radio, and the automatic refrigerator the results of accidental inventions? We hardly think so! What about the work of the great Luther Burbank? What about the experiments now being made with the peanut and with the sweet potato by Dr. Carver, the eminent negro scientist of Tuskeegee, Ala.? If research has brought about such advances in

WE invite our readers to make use of this department for the discussion of any and all problems arising in the mill or finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statement of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

◆ ◆

other lines of endeavor why would the textile industry not be benefited in like manner? Is it not possible that, as great as has been the progress of the textile industry since Samuel Slater set up the first complete cotton machinery at Pawtucket, R. I., in 1790, until the present time, it might have been even better? In fact we are constrained to believe that much of this progress, all through the years, has been the result of research by various mills and individuals. Furthermore, we believe that much of the future progress of this great industry will be the result of research.

In the sixth paragraph of his article "WASH" says, "I hope 'CONTRIBUTOR No. 4022' will admit that the well-managed mills that make money will spend money to make their mills better." Certainly they will, and no doubt some of this money will be spent in research work. Also in the same paragraph, ". . . is the research department a paying proposition or is it composed of deadheads?" Of course, if it is made up of deadheads we can hardly expect the research department to be a paying proposition.

In the last paragraph of the article by "WASH", he further says, "If the research department is not a paying proposition, no textile journal ever carried a greater mission than that of pointing out the fact to manufacturers who may contemplate installing one." Of course we concede that "WASH" is correct here, but we feel that no textile journal will ever stand in the way of progress through research.

CONTRIBUTOR No. 4022

Test on Card Flats

EDITOR COTTON:

On page 98 of the March 1938 issue of COTTON "CONTRIBUTOR No. 6772" says that he heard a debate on new and old card flats, one man contending that the older flats took out less white staple but more trash and dirt.

Well, I have heard some of the older heads say that to set new flats or new clothing as close as the older equipment a faced card will invariably result. In all my grinding and carding experience I have yet to set or authorize to be set a card differently due to new clothing or flats.

To be reasonable is to say, if the flats have not shed a lot of wire, or have not become loose in the foundation, there is no earthly reason why an older set should not do as good work as a new set, or any to cause them to do better either. However, if the wire is worn down to or near the knee in the flats, there is more to think and talk about.

In running a test on 224 cards at one time, about a dozen in a lot, I found considerable variation on them regarding the amount of flat strips being removed. There were 100 of them installed at one time, and all the clothing and flats the same; that is size of wire and make of clothing on the 100 cards, the same type of goods being put through, and the variation on them ran from 1.76 per cent to 4.28 per cent flat strips. Then on the 124 other cards the flats were some new, some old, and some not so old, the variations being from 1.91 per cent to 4.15 per cent flat strips.

The initial test on the 100 was brought about due to the fact being revealed that these cards, being in a room to themselves, were showing a higher temcentage of strips being reported as waste in the waste house than from the 124 cards that were on another floor of the same mill. As a point to work from, these 100 cards had a faster flat speed than the 124, and the tests were made from the original speed, and later a reduction was made of 15 per cent on these flats in surface speed. Here are the results of six cards taken at random with the original high speed, and the reduction of 15 per cent in speed having been made. The percentages are of flat strips, each card running approximately 625 ounces of finisher picker lap.

Flat Strip Percentages

Card No.	Old Flat Speed, % Strips	15% Reduction in Flat Speed, % Strips
1	2.74	2.59
6	4.12	3.38
11	3.32	3.07
16	3.05	2.90
21	3.85	3.38
26	3.84	3.69

Then with two other cards that were situated side by side, ground by the same grinder, and set up by the same grinder from feed plates to doffer combs, we found the following facts, before and after changing the pulleys to make the 15 per cent reduction in flat surface speed: Net cotton in ounces, other figures of waste are percentages,

Card No.	Net Cotton Ounces	Flat Strips Per Cent	C & D Strips Per Cent	Screen Waste (Fly) Per Cent
129	618	3.39	.48	3.22
130	618	3.39	.65	1.72

After changing pulleys to reduce flat speed 15 per cent,

Card No.	Net Cotton Ounces	Flat Strips Per Cent	C & D Strips Per Cent	Screen Waste (Fly) Per Cent
129	612	2.92	.49	2.78
130	624	3.04	.48	1.28

Invisible waste, clearer waste and sweeps were not computed in this test, but this will not change the picture regarding the flat strips in percentages produced.

These facts may be rather superficial, but they give an idea of what the condition might be after having been tested.

Reliable authorities tell us there is almost as large a percentage of long fibers in flat strips as there are in the finisher laps. If so, the result is not as astounding as we might think, but we do get out a lot of trash and dirt, as well as doing a fair job of paralleling in the carding process.

Flats when ground down to the point where they aren't functioning properly are ready for replacement. But if they are dull they will not take out as much inferior material as when they are sharp. The settings have much to do with the work, and the closer the flats can be set the cleaner the work and so on. Neps are more readily removed when the

flats are set closer, as well as more dust and foreign matter.

I think that if "CONTRIBUTOR No. 6772" in forming an opinion of the matter will do a bit of research he will find out something that will surprise him. First, by closely examining his stripping plates he will find them sprung or set off away from the cylinders to where there isn't a lot of difference in the final result if the old and new flats have the same settings, especially at the top plate.

The setting of the top stripping plate, or percentage plate, as some choose to call it, should have the same clearance at each side as well as the middle of the cylinder, and a lot of doctoring may be necessary in order to do this. This shows up very much in those cards that have been moved, or have been levelled and a lot of shims put under one or the other sides, or the front and back of the card.

In conclusion, I still think the flats being in good running condition, evenly worn or ground down, chains properly taut and settings the same, as to plates and flats, the results should be comparatively the same. I have some new flats on my job, as well as some worn down to the evenness of the end clips, and from the appearances that I see, no great difference is showing up. However, there was a range of individual flat strips from 12.3 grains to 17.2 grains which I have brought down by better than 50 per cent by giving the plates a genuine setting by either springing them or by packing them to get the proper setting on each end, the middle, both top and bottom.

J. R. (S. C.)

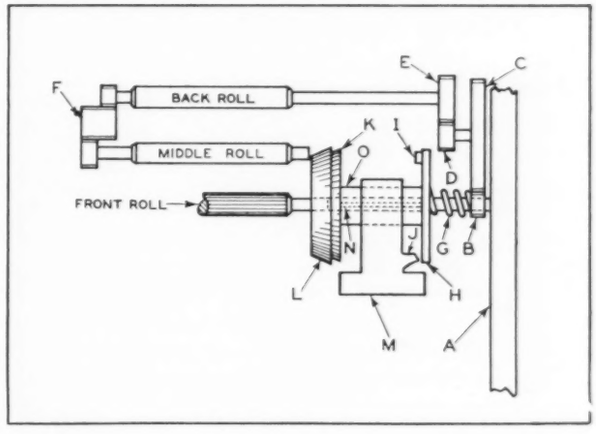
Slub Filling

EDITOR COTTON:

The question* put by "CONTRIBUTOR No. 6727" concerning the making of slub yarn has made me do some retrospecting and reminds me of the many headaches I had when I was trying to make slub yarn some 30 years ago. Although I have had over 50 years mill experience in carding and spinning, I never have worked on a Mason spinning frame.

I hope that "CONTRIBUTOR No. 6727" will agree that a jumping motion will not work because any jumping action fails to hold the strand parallel, causing a lack of twist. He states, "It occurred to me that in the spinning of reverse twist slub filling there might be some advantage in the use of reverse twist roving instead of regular twist." In answer to this, I believe that if the contributor will take the trouble to watch the strands as they are attenuated when passing the action of the drawing rolls, looking through a magnifying glass, he will see that no twist remains in the strand when it is delivered by the front rolls, whether the back roving is twisted right or left.

Slub filling yarn means bunches of untwisted yarn, usually twisted with very fine regular yarn. In my



experimental work with slub yarn I have found that most of my trouble was that the jumping motions or contact ratchet gears caused too much of a shock, even when the frame was running very slowly.

He also states "I understand that sometimes slub filling is made by having the back and middle rolls running constantly and stopping the front roll for a second or two to make the slub." Have the readers any information just how this could be effected on a Mason spinning frame?

Before referring "CONTRIBUTOR No. 6727" to the accompanying sketch, I am wondering if he resides in New York state. It may interest him to know that the man that designed the accompanying sketch is the same man that made the first model of the T. H. Smith stop motion for twisters. This device was run in a mill in the state of New York and no doubt it is from this source that "CONTRIBUTOR No. 6727" heard of slub filling made by having the front roll run intermittently.

I now refer "CONTRIBUTOR No. 6727" to the accompanying sketch, which I hope will prove of service to him. *A* is the head end, *B* is the front roll gear meshing with the crown gear *C*, *D* is the draft gear meshing with the back roll gear *E*. *F* is the carrier gear that revolves the middle roll at the foot of the frame, *G* is a very strong spring, strong enough to insure instant contact between friction cone K and disc *L*. *H* is a disc cast or splined with sleeve *O*, *I* is a projection which strikes another projection *J* cast with the stand *M*. It should be clear to "CONTRIBUTOR No. 6727" that when *I* strikes *J* the friction cone is disengaged from disc *L* and, of course, the front roll is stopped for that moment. If a longer slub is desired, increase the length of *I*. The contributor should also understand that the front roll is in two parts; in other words, the front roll end is at disc *L*. Sleeve *O* slides on key *N*.

In closing I wish to state that in making slub yarn, I found a gradual motion to be the only way that worked satisfactory, and I found the friction cone to operate best. In using the device on the back roll, two ratchet gears are employed and when the ratchet gears are disconnected the friction cone contacts the disc and revolves the back rolls at a great speed for that moment.

The accompanying sketch is for making short slubs.

WASH (R. I.)

*The original question appeared on page 99 of the November 1937 issue of COTTON and other discussion were carried on page 122 of the April 1938 issue and page 110 of the November 1938 issue.

Sizing Colored Warps

ON PAGE 128 of the May 1938 issue of COTTON "CONTRIBUTOR No. 6797" requested information on the sizing of colored and striped warps. In the past he had run all white combed yarns making goods 37 inches wide with from 5000 to 7000 ends in the warps, but upon changing to stripes and solid colors the same results were not obtained at the slashers using the same sizing formula. Imported potato starch was being used. Several answers were received on this contributor's question, the first of whom said:

"The penetration and results from slashing depend a great deal upon the pH of the sizing. No doubt the solution when running white yarns was on the acid side. Usually cotton is dyed with an alkaline solution and when these yarns run through the size box they change the pH over to the alkaline side, whereas, he has been running it on the acid side.

"Alkali tends to make the size thicken and more viscous and will not penetrate quite so well. It will probably be necessary for this man to use a compound that is decidedly on the acid side or add some harmless acid solution to his formula in order to neutralize or offset the alkali that is on his dyed yarns. We sometimes use about one-half pint of alum to a hundred gallon solution and find that this thins our size and makes it run much better."

Another mill man offered the following comments:

"The best information I can gather is that in changing from gray to colored yarn there are so many things that can come up until it is hard for anyone to guess what trouble this contributor is having. We are inclined to think that maybe his trouble comes from excessive chafing of the yarn and that causes lint balls to roll up back of the drop wires. If that is the trouble, then our suggestion would be to add some binder, locust bean gum or some similar material into the size formula. In the gray yarn all the natural oil and wax was kept and naturally the size did not penetrate into the yarn as much as it did after the yarn was dyed, because in dyeing the yarn a great majority of the natural oil and waxes were removed from the fiber. It looks as if this man needs to get a better film on his yarn and we think he could do that with added binder."

The next answer also gave some pertinent suggestions:

"We would advise that "CONTRIBUTOR No. 6797" use a thin boiling starch on all rawstock colors. On beam dye work use about 10 per cent heavier formula, also using a thin boiling starch.

"On beam dye work, after the first 30 cuts are run, we would advise discharging a stream of size out of the size box about the size of a lead pencil and the same amount of fresh size running into the size box until the set runs out. The reason for this is that there is such a large quantity of water in beam dye sets that it weakens the size very quickly."

Before going to press we learned from "CONTRIBUTOR No. 6797" that he had solved his problem; his letter follows:

"Just a line to let you know that we have about conquered our troubles on colored work—thanks to you and all the others that offered assistance.

"We found through experimenting that we were not using enough softener to get the proper penetration; since we have increased our tallow 10 per cent we have as smooth warps as you ever saw. The funny part of it is we thought we had the best sizing formula in the world, and it was good, but since adding the extra tallow our white work has picked up wonderfully. Our production has increased from 90 per cent to 93 per cent on white work, and our seconds have dropped nearly one-half."

Speeds and Settings for Pickers

EDITOR COTTON:

In answer to "CONTRIBUTOR No. 6790", whose question on beater speeds appeared on page 101 of the March issue of COTTON, I would say that it looks as if the speeds and settings he has given in his inquiry should give good results.

The Question

EDITOR COTTON:

About two years ago we installed the one-process picking unit and to date all of the speeds, settings, beats per inch, etc., are just as the installation man left them. We are getting fairly good results from this process and our yarn breaking strength stays reasonably close to standard; however, we think that we would get better results in cleanliness and breaking strength if our settings were a little closer and the beats per inch decreased. **Before doing so, though, we are asking the readers of COTTON to give us their opinions and advice regarding our present set-up.**

We are running 1-inch Middling cotton making a 13½-ounce lap. Speeds and settings are as follows:

2-Blade breaker beater	1158 r.p.m.
2⅛-inch feed roll	15 r.p.m.
Feed roll to beater	3/16-inch
Beats per inch	23.13
2-Blade intermediate beater	1288 r.p.m.
2-inch feed roll	13 r.p.m.
Feed roll to beater	3/16-inch
Beats per inch	31.54
3-Blade carding finisher beater	965 r.p.m.
2-inch feed roll	13 r.p.m.
Feed roll to beater	¼-inch
Beats per inch	35.44

CONTRIBUTOR No. 6790.

Frankly, I think that settings of 3/16-inch for feed roll to beater (2-blade) is the general practice and can hardly be improved on much. I do not believe he could improve his laps to try to set any closer. This is also true with the 3-blade carding beater at ¼-inch. Of course, the closer he can set this type of beater, without danger of striking, the better the work produced. However, since there is always some danger of the pins being a little out of line, or varying, it is not very practical to get closer than he is setting at the present.

As to the beater speeds, he gives 1158 breaker, 1288 intermediate, and 965 finisher. If this man is having any curling of his cotton he might find that this would be helped by cutting the speed to about 865 on his carding beater, and this might also improve his evenness and breaking strength. The speed on blade beaters is not too high.

With limited information as to the kind of yarn he is making, it is difficult to give information that

would be entirely right for his mill. However, there is one little point that I would like to pass along to this man inasmuch as he is making a 13½-ounce lap: Many tests have proven to me that a little heavier lap and a little longer draft at the card is a great improvement over the lighter lap and shorter card draft. It is possible that this man may not be able to do this, but if he can, I strongly recommend it to him.

CONTRIBUTOR No. 6792

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EDITOR COTTON:

It seems to me that "CONTRIBUTOR No. 6790" is doing a good job with his present settings. If he is getting good results I would be very slow to make any change. The only suggestion that we would make is that the beats per inch on the finisher picker of 35.44 be increased to between 45 and 50 beats per inch in order to get a cleaner stock; however, I do not think this will improve the breaking strength of the yarn. For his class of work, I think the settings are ideal and I do not see how he could hope to do any better.

CONTRIBUTOR No. 6793

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EDITOR COTTON:

"CONTRIBUTOR No. 6790" has asked some questions cn beater speeds and breaking strength. Assuming that this man is using gin packed cotton, I would suggest that he lower his beater speeds, in fact, the complete picking line, that is, if he is processing as much as 300 pounds per hour. His settings seem to be all right with the exception of the Kirschner beater, which is set ¼-inch to the roll. I rather think he must be beating off the treadle plate instead of the feed roll. I would set it as close as I could, which will give a much better lap. In experimenting with slower speeds, his fan drafts should be manipulated so that he will have enough draft to draw the light particles of good fiber back into the beater box after they have been knocked through the beater guard.

CONTRIBUTOR No. 6794

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EDITOR COTTON:

In reply to "CONTRIBUTOR No. 6790" and his inquiry asking for information regarding possible alterations in his one-process pickers that will aid in increasing his breaking strength, I wish to make the following comments:

In the first place he should have given his production per hour, the method of opening his cotton, whether he has any control system on his tandem outfit, etc. Then it would have been easier to give an opinion. However, his speeds are in fair order even though they are a bit high for the best work and the most effective cleaning. For best work, pickers on 13½-ounce laps should not produce more than 5 yards per minute of finished lap, and even with the proper speeds and beats per inch correct, with the controls this is a vague picture as to effective blows per inch on the first two beaters, unless he states the amount of cotton that is under the feed roll all the time. Five yards per minute of finished lap will give about 255 pounds per hour, which is enough cotton to go through any Kirschner beater, or any other kind of beater to get quality work. If his staple is good, I would alter his present set-up as follows:

	Present	Alter to
Two-blade breaker beater	1158 r.p.m.	1050 r.p.m.
Feed roll to beater	3/16-inch	1/4-inch
Two-blade intermediate beater	1288 r.p.m.	1150 r.p.m.
Feed roll to beater	3/16-inch	1/4-inch
Kirschner finisher beater (3-blade)	965 r.p.m.	900 r.p.m.
Feed roll to beater	1/4-inch	3/16-inch

In making the settings he should examine his beaters to see that they are in good condition and that the pins in the Kirschner beater are satisfactory. For a gauge, I believe that a piece of brass is better than the usual piece of key steel or wood. These changes in speed may warrant the opening of his stripper roll in his hopper or the speeding up of his apron in order to put the desired amount of cotton through to his beaters, but even this will help him some.

Increasing the break factor on pickers is not as easily done as some might think. There are numerous things that have a part in this: Make sure that the striking edges of all the blade beaters are sharp, even if they have to be removed from the pickers and re-finished on the milling machine. Never use a file on them because there is no eye that can put a straight edge on them for 42 inches. If the beaters are sharp the pickers won't sound like an airplane. Examine the grid bars and their settings because these not only control the amount of seeds removed, but also the white cotton that is thrown into the seed box.

The best setting that I ever used on grid bars was ¾-inch to the face of the beaters, and I used a gauge about 3 or 4 inches long, squared to ¾-inch. The grid bars should be set on a perfect circle, not allowing any to be up and some down, or at a different pitch. Curled stock should be avoided—this is caused by high speed cleaning, opening, and picking.

To be of more help in this situation and to help increase his breaking strength, I would like to learn his roll settings on his drawing, and all processes of roving, his hank roving, and twist in the hank roving, draft, counts made, and whether his spinning is creeled single or double. These factors have as much to do with increasing the breaking strength as his pickers.

CONTRIBUTOR No. 6795

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EDITOR COTTON:

In answer to "CONTRIBUTOR No. 6790", I suggest that he first try the removal of a grid bar, preferably the second bar, from the beater. If this does not give the desired results as to quality and strength, other like grid bars may be satisfactorily removed from the intermediate and finisher beater sections. I have used this procedure to the extent of as much as two bars on the breaker section in addition to one each on the other sections and secured very good results as to richness of motes and still have held up the breaking strength.

CONTRIBUTOR No. 6799

Life of Spinning Rings

EDITOR COTTON:

This answers the questions on ring spinning as asked by "CONTRIBUTOR No. 6845" on page 96 of the June issue of COTTON.

1. What is the life of spinning rings working continually on coarse counts up to 40s, and those on fine counts up to 150s, and at what period is burnishing of rings recommended?

The life of spinning rings depends on the attention given when starting them new. Speed frames are run at the beginning, whether mill changes counts of yarn frequently, frequency of traveler changing, type of travelers, and quality of rings used, all have their effects. On coarse numbers up to 40s with good conditions, the rings should run for 10 years at 80 hours per week. They probably could run longer, but for good running conditions, they should be changed at about 10 years. I know of the best running spinning rooms where they kept a definite system of purchasing new rings every 10 years, and every 5 years the rings were turned (double flange). This was running the mill on a 2-shift basis of 48 hours each. On finer counts, with all conditions good, about 5 years longer life should be secured. No one can state definitely the life of spinning rings in a mill because there are so many variables.

Burnishing of rings is not as necessary if the rings are given proper attention when new, and the rings should be wiped thoroughly dry when the frames are scoured. The only recommendation is to burnish the rings when they need it. I have seen a burnisher made of a wooden block with 8 sets of bristles (not wire), arranged in zigzag order around the block. The ringrail is set at the proper height to fit the burnishers and the spindles run at a speed of 10,000 r.p.m.

2. Is the cleaning of rings occasionally with a liquid preparation advisable, and, if so, what best suits the purpose?

I do not recommend cleaning rings with a liquid preparation. I prefer using a small stick and cloth or waste for cleaning the inside of the rings. Take the ringrail off and place it on a pair of wooden horses and clean. This can be done at the same time the frames are scoured.

3. What apparatus is used for removing the old oil from the spindle bolsters? We have trouble in not getting the dirty dregs entirely removed from bottoms.

Pump the oil from the bases with a hand or electric pump and wipe the spindle, base, and bolster. Then wash all three in paraffin oil. A pail about one-third full of paraffin oil should clean about 600 spindles. Enough spindles (complete) should be put into the pail so that they are immersed in the oil and given a thorough shaking. It is important that the complete spindle be kept together in cleaning, after which each part can be wiped thoroughly clean. If spindles and bolsters and bases are intermixed during this cleaning the best results in starting the frames will not be obtained.

4. We have a bit of trouble with "sloughing-off" at the winding off at about 2 inches from the bottom; this gives us complaints from the weaving department, chiefly on 36s and 50s on 5/8-inch bobbins, 8,000 r.p.m. spindle speed.

I suggest that the length of traverse be lengthened at the bottom one-eighth of an inch. If this does not remedy the trouble, try another one-eighth. Sometimes it is necessary to increase the length of the traverse up to the first groove or ridge of bobbin to eliminate sloughing-off.

5. Is as heavy a traveler as possible considered best for the yarn, or as light a one as possible preferred by the spinner for better spinning?

Travelers that are either too light or too heavy will affect the yarn. The traveler must exert the correct tension on the yarn and must attain uniformity of tension as far as possible for best results. I have seen spinners that prefer separators on filling frames so that they can run light travelers; in my experience separators do not give the best results and I have removed them on the filling frames and heavied up from 4 to 5 numbers on the traveler and obtained better spinning and better wound bobbins for weaving.

6. What clearance is recommended between yarn on the bobbins and the ring and what method is used to measure them? We allow 1/8-inch clearance and use 10 bobbins.

This is considered good standard mill practice. A wooden gauge will prove helpful for inspecting the bobbins.

CONTRIBUTOR No. 6885

Other discussions on this subject appeared on page 98 of the September 1938 issue and page 99 of the December 1938 issue.

An Operative Speaks

On co-operation within the department, and makes some pertinent comments for making the battery filler's job more efficient . . . . . .

EDITOR COTTON:

We operatives of the textile mills are aware that it requires money to run the mill, to purchase cotton, and to meet the weekly payroll, and we should know that it requires an alert executive to keep abreast of changing styles and fashions. This is all left up to the management, but we as individual workers who operate the machinery should consider it our job and problem to run the machinery as we are instructed, and a little more. It is the "little more" that puts us on the next step for promotion.

With the mills running on short time and making little profit, we should realize that then is the time to show our best workmanship—to save the company's supplies more than ever before—to work together. We should remember, too, that the entire town is dependent upon us for its livelihood.

If we are inspectors, we should do our best to notice every flaw. If we are weavers, we should know that every yard of cloth coming from the looms on our stands has had close attention. The marks of a good weaver are staying on the job, keeping one's self clean and the job clean, having safety in mind at all times, developing one's weak points, and enjoying one's job.

If we are loom fixers we should keep the loom in good running condition without waiting for a flag to tell us that the loom will not run, endeavor to keep our section better than the others, and concern ourselves with the consumption of supplies.

If we are battery fillers we can do many things to make the work run well. If the batteries are filled incorrectly the weaver will suffer.

Mixed filling makes poor cloth and there are many ways we can prevent it: Have all batteries marked and remember to tell the proper person when the warp runs out. Unload the battery when the warp is out. Be sure all filling trucks have the number of the filling marked on a tag on the truck. Never throw a handful of filling back into the box without first looking to see if it is the right box—someone may have moved the box since the last time we filled our trucks. When picking bobbins of filling off the floor, be sure it is the right loom before putting it in the battery. Talking when filling batteries often causes mixed filling. If in doubt whether the filling is the proper number for a loom, ask the overseer. Keep all pieces of bobbins out of the quill cans. Never put a quill of filling on any part of the loom as it may cause oil and rust in the cloth. When putting quills into the battery, be sure no ends are left hanging as this will cause the filling to break. Be sure the thread is pulled to the end of the quill and placed properly in the notches in the battery. Wrap threads firmly around the thread holder. Remove bunch of thread from thread holder every time the warp runs out. Strive to keep the filling clean. Keep the uniforms clean. Watch the cloth as it is woven on the looms and report any bad cloth to the weaver. When necessary, flag the looms for the fixers because unnecessary delay costs the company money. Pick up all quills from the floor as this saves the company money and prevents accidents.

We should strive to make our department the best in the mill and it will soon reflect evidence of our co-operation, loyalty, safety, and workmanship.

CONTRIBUTOR NO. 6866

"Passing the Buck"

EDITOR COTTON:

Frequently occurring in every organization is that inevitable weakness all possess in attempting to "pass the buck" for some error that shows up in the general course of operation.

In this era of numerous self-appointed, over anxious critics, it seems to me some means of curtailing or weeding out this buck passing, or some device or system should be concocted to nail the blame onto the right party; a certain few feel as though they are the universal scape-goats.

The part of everyone in an organization should be so well fitted, and he should be so pleased with his job and the attitude of the management that he can truthfully say, "I like my job". To be eternally on the warpath, punching someone in the ribs, or calling the operatives onto the carpet for reprimanding will never create a harmonious spirit as long as human nature is made from the material of which it is.

It is foolish to expect the subordinates (that is, overseers, second-hands, or section men) to try to foster a good spirit if the immediate superior is continually giving them a raking over, or *bawling out* about some trivial matter that isn't defined as it should be. If a superintendent wants good feeling in his mill, or an overseer wants smooth sailing in his department he must never get so personal with anyone in his decisions and criticisms as to cause his assistants and workers to hold an ill feeling toward him.

One overseer's rule is that if a man ever used a tone of voice louder than his ordinary conversation in giving or following up orders, he openly admitted his fear or was licked and sought revenge in this manner.

To get at the root of buck passing, there are certain methods that have been resorted to. By gaining ideas from several sources we can form a system that helps to put the blame where it should be. Criticisms and reprimands are much easier made effective if praises and compliments are given when merited. To expect a subordinate or worker to keep a smile on his face, and be continuously reprimanded in an insulting, repulsive manner about certain things that are only partially explained, is about as consistent as pouring boiling water in July onto a block of ice, and expect the ice to retain its solid form.

Many times men are accused of passing the buck when trying to execute orders. This can be overcome by a thorough, detailed explanation to those that have to give and follow up these orders. In other words, explain to the layman, "How come?"

System to Prevent "Buck-Passing"

To be habitually crabbed or hard-boiled or even hard headed when approached is a nasty disposition on anyone's part. Courtesy is a trait that all should acquire, or should I say envy.

One organization, of which I was once a member, had a system to prevent buck-passing that was ideal. The sum of this was that the duties of every operative, from the sweepers to the section men, were written on a guide sheet outlining the duties of each work day, including all operations, such as frequency of cleaning, doffing, oiling, inspection of cupboards, oil tanks, top rolls, gears, tightening of couplings, certain detailed set screws and pulleys, belts, scouring, etc. In another organization I know of, no order was given to any one unless it was written, in fact the caption on the orders was "Verbal Orders Don't Go—Write It." This is another means of lessening buck-passing.

These guide sheets mentioned were typed, framed, and posted as near the center of each man's job as could be arranged, and in so doing the operatives were constantly reminded of their expected duties. Of course, there were certain changes that came about; these minor alterations were filled in by the overseer, or he had new guide sheets typed, replacing the old ones.

Some men object to posting these items, but believe you me, it is a boon to good management if used consistently.

To prevent buck passing have your program so laid out that it is fool proof. Then if any blame or discredit is due, pin it on the guilty party, nipping it in the bud.

CONTRIBUTOR NO. 6896

Sizing Problem

ACTING AS THE clearing house for practical mill problems, the editors of COTTON received the following letter from a cotton mill executive. "We are making plain sheetings and bag goods, but our customers claim that our cloth has a more dark or grayish cast than it should. Our cotton is Middling white and we are using a low tapioca flour in sizing, cutting it with sulphate of alumina, with a tallow lubricant that is 85 per cent tallow. The warps run well in the looms but we would like to know if there is any size formula that will produce a brighter effect, and if it will be practical to use such chemicals." This question was passed on to several reliable sources of information without revealing the identity of the inquirer, and several answers were received:

1. "We have all discussed this matter and will give you the best answer possible under existing circumstances. Of course, we know that you realize it is a very hard matter to give you the information asked for without being familiar with all of the conditions.

"First we would suggest a much better grade of flour or starch, preferably corn starch, and second the discontinuing of the sulphate of alumina, and cooking the proper length of time, and at the proper temperature to take the place of this ingredient. It might also be well to use a lubricant or softener manufactured from fats which will give a brighter color than tallow.

"Within the past three weeks we have had this same situation to come up. By making changes similar to those referred to in the foregoing, thoroughly cleansing the cooking kettle, pipe lines, slasher boxes, making certain changes on the covering of squeeze rolls, etc., we were able to overcome the dull color of the cloth and give the mill a much-improved product."

2. "We have never used tapioca to any great extent, especially the low grade. We have, however, run some tests on tapioca and on sago and found the very trouble that this man mentions. Of course, goods that are going to the finishing trade where the size is removed would not find this condition undesirable. In our case, many of our goods are used in the gray with some of it going to the counter trade. We found that even though corn starch is more costly than tapioca or sago the appearance of our goods was so much better that it paid us to use it for our customers. Another thing we have found that tends to darken the appearance of our cloth is the oil spray put on either in the opener room or picker room. This oil spray does tend to darken the cloth somewhat."

3. "From our experience there are three reasons for this off color: Low grade tapioca gives a darker color than any other starch except low grade sago. The 85 per cent tallow if made of an off color tallow or mineral grease could be adding to the bluish tint caused by the tapioca. Sulphate of alumina is strongly acid in reaction and caused an increase of blue from the tapioca. Also, the use of this acid salt has been condemned by many finishers and users of cotton cloth on account of its acid reaction and deposits on the cloth. A good, but not necessarily best, grade of tapioca flour or corn starch will give a whiter color to the cloth. We also suggest that this mill see that the right color tallow, with no spindle oil with a bloom, is used in the tallow lubricant. There are better modifying agents to use in the size besides a variable acid salt."

4. "It is my opinion that the size mix would be definitely on the acid side due to the hydrolysis of the alum being used and that the discoloration was due to traces of metallic salts formed by the action of liberated acids not only on the metallic surfaces of the equipment but also on the traces of impurities in the tapioca flour. To remedy the situation would require either a change in type of thinning agent for the starch or else a change to a sizing compound on the alkaline side. If this man should choose to continue the use of alum, I suggest that he use an alkaline emulsified tallow and bring the pH of the finished size up to about 7."

New Trends in Textile Training

(Continued from page 53.)

they would have to work for them. It is to be admitted, however, that many students really know a subject but, somehow, are not able to put the facts down on paper on a test, and on the other hand some who make excellent marks on examinations really do not understand all of the fundamentals of the subject under discussion, so in light of these facts, the instructor was able to make due allowances as progress was made and he could judge from the daily class work just about what each student really knew.

The designing, which admittedly might not benefit many of the students, was given especially to prepare the students for fabric analysis, which is to be taken up during the second year. Each student was required to keep a note book in which, on one sheet he mounted his designs, and on the next sheet the rules or explanations and the problems in each weave. Among the weaves learned were plain weaves, plain weaves color effect, basket weaves, various kinds of twills, satin weaves, double cloth weaves, lenos and others, together with drawing-in and chain drafts. The materials consisted of regular cross-sectional paper, various kinds of colored pencils and a bottle of glue. (The students furnished these as well as the text books used in the course in mill processes).

There is talk of a central textile school building with a laboratory. We do not know whether this will materialize or not, but we are wondering if this new type of textile class does not indicate a new trend of textile training, with better qualified instructors, more intensive study, a better co-ordinated program than has been possible under any of the older systems.

Two thousand six hundred years ago Aesop said, "They that tax our mills unmercifully will live to see them carted to another region."

13th

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205. The Walker Method—8 page illustrated catalog describing the Walker method of quickly checking the efficiency of machinery. This improved method eliminates the losses resulting from improperly adjusted equipment. Walker Electrical Company, 926 Means St., Atlanta, Ga.

213. Saco-Lowell Cotton Machinery—Twisting—a 36 page illustrated brochure explaining the company's twisters and parts, including the four basic type twisters, features of new construction and general notes on twisting. Production calculations and specifications are included. Saco-Lowell Shops, 147 Milk St., Boston, Mass.

214. Saco-Lowell Cotton Machinery—Spinning—the second edition of a 56-page booklet, illustrated with the company's product and containing valuable charts, production tables and other spinning data. Saco-Lowell Shops, 147 Milk St., Boston, Mass.

217. Diamond Fibre Hollow Ware—32 page booklet and catalog, attractively illustrated, showing various types of boxes, trucks, cans, barrels, baskets and trays of Diamond Fibre Hollow Ware. Of interest to every mill man in solving material handling problems. Free on request. Continental-Diamond Fibre Co., Dept. C, Wilmington, Delaware.

218. Butterworth Electric Guiders—6-page folder describing and illustrating the new Butterworth Electric Cloth Guider. This guider is built on the same principle as the Foxwell Air Guider and is unexcelled for fast, accurate guiding. H. W. Butterworth & Sons Co., Philadelphia, Pa.

219. My Strap-Book by Doc Steelstrap—16 page illustrated catalog describing the hundreds of ways that Acme steel strap can be used to advantage in connection with paper boxes and wraps in making safe, economical shipping boxes. The strap-book will convince you that Doc Steelstrap and his assistants do a thorough job of the packing and shipping business. Acme Steel Co., Chicago, Ill.

223. Alloyed Iron in Southern Industrial Fields—16 page illustrated catalog dealing with the properties available in modern cast irons. International Nickel Co., 67 Wall St., New York, N. Y.

224. "Tank Talk"—Sixteen page booklet of illustrations showing various types of elevated steel tanks, constructed and erected by manufacturers as well as stand pipes, reservoirs, storage and high pressure vessels, cylinders, along with helpful technical data. Also a list of what a few of the cotton mills, etc., said. R. D. Cole Manufacturing Company, Newnan, Georgia.

228. Solutions for Your Problems—20-page illustrated booklet containing valuable information on the scouring and processing of wool and other fibres. Detergent Products Corp., Atlanta, Ga.

233. Catalog No. 22—an attractive illustrated catalog describing in detail the Shamrock shipping containers and the new canvas trucks for textile use. Meese, Inc., Madison, Ind.

234. They Stay Brighter Longer—This interesting illustrated booklet containing facts about Mazda lamps will be sent you free on request. General Electric Company, Dept. 166, Nela Park, Cleveland, Ohio.

238. Glorified Light—A 32-page book illustrative of the vital part proper painting plays in scientific lighting and in the reduction of maintenance and production costs. Pittsburgh Plate Glass Co., Pittsburgh, Pa.

240. The New Proctor Automatic Yarn Dryer—6 page illustrated folder describing the new Proctor automatic yarn dryer which has the exclusive new Proctor traveling skein protector. Proctor & Schwartz, Inc., Philadelphia, Pa.

253. Brown Air-O-Line Controllers — This booklet will prove invaluable to the men in charge of dyeing, finishing and slashing, as well as the textile executive. 32 illustrated pages describing the various Brown Controllers. The Brown Instrument Co., Philadelphia, Pa.

258. Automatic Overhead Cleaner for Spinning, Winding, Warping and Twisting—24 page booklet showing the new American MonoRail automatic cleaner in operation on MonoRail track circuit over Spinning, Warping, Winding, Twisting, etc. This cleaner incorporates a new scientifically designed blower producing a whirling column of air directed and controlled so that it prevents accumulation of fly with no harm to roving. The American MonoRail Company, Cleveland, Ohio.

259. Cotton Conditioning with Texspray Compound—18-page booklet describing the Texspray method of cotton conditioning. It has been proven that this method will save money, increase production, increase flexibility of fiber, eliminate static and reduce fly and dust. The Texas Company, New York, N. Y.

260. Lubrication—This attractive booklet contains valuable and interesting articles on loom lubrication and also on spinning design and the function of spindle oils. The Texas Company, New York, N. Y.

261. The Brown Moist-O-Graph—16 page booklet describing the Brown Moist-O-Graph which measures, records and controls the moisture content of cotton warp yarns. The Brown Instrument Company, Philadelphia, Pa.

263. Gastonia Brushes—New catalog and price list showing the complete line of brushes for the textile mill. Gastonia Brush Co., Gastonia, N. C.

264. American Pressed Steel Trucks—16 page illustrated catalog describing the American line of trucks and industrial truck wheels. American Pulley Co., Philadelphia, Pa.

268. Factoring and Financing—Illustrated booklet which outlines the functions of factoring in the textile industry. Textile Banking Company, New York, New York.

269. Stainless Steel Equipment for the Dyeing and Textile Industry—Attractive four-page folder describing the Blickman line of dyeing equipment. S. Blickman, Inc., Weehawken, N. J.

271. The New American Adjustable Diameter Wedgebelt Pulleys—illustrated leaflet describing the American adjustable diameter sheaves designed to produce the best performance in all types of V-belt driven textile machinery. American Pulley Co., Philadelphia, Pa.

272. Where to Buy Monel Metal Textile Equipment—Attractive booklet which lists the names and addresses of experienced fabricators of Monel Metal equipment for the textile mill. The International Nickel Company, Inc., 67 Wall St., New York, N. Y.

276. Continuous Vulcanization of Transmission Belting—12-page booklet containing facts based on data assembled during the development of this new principle of belt manufacture and the performance of the product in actual service. Boston Woven Hose & Rubber Co., Cambridge, Mass.

277. Bulldog Rubber Tension Roll Covering—attractive four-page folder describing the new scientifically correct product designed for taking off all synthetic fabrics, natural silks and fine cotton goods. Boston Woven Hose & Rubber Company, Cambridge, Mass.

278. Textile Testing Laboratories—a 10-page illustrated booklet describing a modern textile testing laboratory and pointing out the necessity for laboratory air conditioning systems. Ask for bulletin 136. Parks-Cramer Co., Fitchburg, Mass., and Charlotte, North Carolina.

279. When Cleaning's Automatic, a Spinner's Free to Spin—a 10-page illustrated booklet dealing with the Parks automatic traveling cleaner. Ask for bulletin 1036. Parks-Cramer Co., Fitchburg, Mass., and Charlotte, N. C.

284. Morton Nickel Iron Quick Opening Handle Gate Valve—Illustrated leaflet describing the new Morton Valve for dyeing machines, pipe lines, steam and water lines, boiler blower valves and throttle valves. Morton Machine Works, Columbus, Georgia.

286. Tricon W-30—Study of wetting agents and their activity with recommendations for textile processing. Rohm & Haas Co., Philadelphia, Pa.

287. New American Pulley Motor Base Catalog—an attractive new illustrated catalog describing in detail construction and application of new tension control motor base. Includes data comparing performance of drives with and without tension control motor base and applications are shown for both flat and V-belt drives. American Pulley Co., Philadelphia, Va.

288. Nopco Softeners and Wax Finishes—14 page booklet describing the various Nopco Products for finishers of cotton goods. Natinal Oil Products Co., Harrison, N. J.

290. Hyatt Roller Bearings on Textile Machinery of All Kinds—34 page booklet which describes and illustrates how Hyatt bearings are being applied to textile machinery. Hyatt Bearings Division, Newark, New Jersey.

291. Wolf Products for the Textile Trade—Illustrated booklet describing the Wolf line of chemicals for the printing, dyeing, sizing and finishing of all textile fabrics. Jacques Wolf & Co., Passaic, N. J.

293. Mind Your P's and Q's—Attractive folder describing and illustrating the brands, properties and uses of silicates of soda. Philadelphia Quartz Company, Philadelphia, Pa.

294. From a Locomotive to a Pig—Attractive ten-page booklet describing the advantages of Metso as an ideal cleaner in the textile industry. Philadelphia Quartz Company, Philadelphia, Pa.

295. Fence Facts—A new booklet illustrating and describing chain link fence in a variety of styles and four different metals for every type of fencing installation. Also wrought iron fence in various beautiful styles. A concise handling of information for those wanting facts about fence. Page Fence Association, Bridgeport, Conn.

296. Full Fashioned Hosiery Manufacture — Illustrated folder giving the history of full-fashioned knitting and describing in detail the different processes in present day manufacturing and the application of Gulf lubricants to the various machinery. Gulf Oil Corporation, Pittsburgh, Pa.

297. Lunkenheimer List Price Schedule R-I—new 44 page catalog covering the entire line of valves, boiler mountings and lubricating devices manufactured by the Lunkenheimer Company. The Lunkenheimer Company, Cincinnati, Ohio.

298. Empire Textile Mill Crayons — 4-page folder and color chart describing and illustrating the Empire line of textile mill crayons for marking roving or yarn. American Crayon Co., Sandusky, Ohio.

299. The New International Time Recorder—information on the new automatic time recorder which gives complete wage and hour records. International Business Machines Corp., New York, N. Y.

300. Solving Your Payroll Problems — illustrative booklet which tells how to comply with federal and state legislation and outlining methods by which payroll costs can be reduced. Stromberg Electric Co., Chicago, Ill.

301. Norma-Hoffmann Bearings Catalog — Norma-Hoffmann Bearings Corp., Stamford, Conn.

302. Sirocco Unit Heaters — Descriptive literature on the American Blower line of industrial unit heaters. American Blower Corp., Detroit, Mich.

303. The New Boyce Rayon Knotter — This new knotter increases production, eliminates perspiration and chemical stains and makes clean, uniform knots. Over 2,000 of these knotters are now in use. A. B. Carter, Inc., Gastonia, N. C.

304. Profit Opportunities for Your Business in North Carolina—literature on the advantages and opportunities offered by North Carolina to textile manufacturers. Industrial Division, Department of Conservation and Development, Raleigh, N. C.

306. Waterproof with Sco-Co—information on the advantages of using Sco-Co industrial finishes and paints in the textile industry. Southport Paint Co., Inc., Savannah, Ga.

307. Lane Canvas Baskets—16 page illustrated booklet describing the Lane line of canvas baskets for textile use. W. T. Lane & Brothers, Poughkeepsie, N. Y.

308. Finnell Scrubbers—illustrated leaflets describing and giving specifications for the new Finnell floor scrubbing machines. Finnell System, Inc., Elkhart, Ind.

309. The Tasco Process—illustrated folder describing the Tasco process for grinding and polishing carrier tubes on knitting machines. Thomas & Skinner Steel Products Co., Indianapolis, Ind.

310. Replacement Parts for Knitting Machines—attractive illustrated folder describing the Thomas & Skinner line of replacement parts for all types of knitting machines. Thomas & Skinner Steel Products Co., Indianapolis, Ind.

311. The Romance of Prairie Gold—attractive illustrated book which tells the story of corn and the uses of corn products in industry. Corn Products Sales Co., New York, N. Y.

312. Cork—The Modern Roll Covering—attractive booklet outlining the uses and advantages of cork for textile roll covering. Armstrong Cork Products Co., Industrial Division, Textile Products Section, Lancaster, Pa.

313. Detergent Wall Card—valuable and handy wall card listing pH strengths in both acid and alkali solutions. Chemists and dyers will find this chart invaluable in their everyday work. Detergent Products Corp., Atlanta, Ga.

314. Winding Production Chart—this useful production chart can be used for any style of winder. Also included are instructions for figuring yarn takeup speeds. Universal Winding Co., Providence, Rhode Island.

315. How Handling Problems Have Been Solved—a 50-page booklet presenting in pictorial form many solutions to industrial handling problems and showing how they reduce costs, save labor, eliminate storage and provide free movement of stock between processes. American MonoRail Company, 13106 Athens Ave., Cleveland, Ohio.

CONTINUED ON PAGE 98

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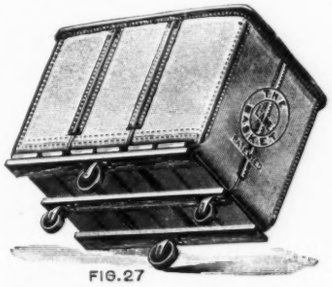

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Continued from Page 96

316. Ditto Payroll Record System—this special book has shown hundreds of textile men how to speed and simplify payroll routines. It shows how to save. Ditto, Inc., Chicago, Ill.

11. Whitinsville Rings—16 page illustrated booklet describing ring manufacture, measurements, types, uses. How to determine flange sizes. By Whitinsville Spinning Ring Co., Whitinsville, Mass.

29. Continuous Card Stripper—A 20 page booklet describing in detail continuous card strippers, their advantages, the power required to operate, etc. Saco-Lowell Shop, 147 Milk St., Boston, Mass.

30. Lubrication of Textile Machinery—32 pages illustrated. Data covering the economical lubrication of all textile machines. New York & New Jersey Lubricant Co., 292 Madison Ave., New York, N. Y.

38. Sleaziness in Full Fashioned Knitting—Illustrated survey with samples of fabric showing causes of sleaziness and methods to be employed in eliminating it.—By Textile Machine Works, Reading Pa. (This company also issues parts catalog for Reading full fashioned machines with general information on subject of full-fashioned knitting.)

55. Interpretation of Analysis for the Layman—An eight page booklet explaining what the various items used in fatty oil and sulfonated oil analysis mean, enabling the ordinary textile man without chemical education to interpret the various chemical analyses. National Oil Products Co., Harrison, N. J.

62. Rubber Products for the Textile Industry—A 40 page booklet giving a wealth of information on the proper selection, installation and operation of rubber belts, together with charts, showing horsepower rating, pulley sizes, V-belt sizes, also information on all types of hose and rubber covered rolls used in the textile industry. Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.

64. SKF in the Cotton Mills—A twelve-page booklet showing the advantages in power consumption, increased production, savings in lubrication, increased yarn breakage strength to be secured through roller bearing spindles. SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.

65. Bulletin No. 500. Cooper-Hewitt Industrial Illumination—booklet explaining in detail the importance of good lighting and the necessity of proper quality as well as proper quantity of light. General Electric Vapor Lamp Co., Hoboken, N. J.

70. Fafnir Ball Bearings for One Process Pickers—outlining the advantages of ball bearings in guaranteeing smooth, accurate motion, particularly on eveners, as well as uninterrupted production, ease of operation and cleanliness of bearing units throughout the one-process pickers. Fafnir Bearing Company, New Britain, Conn.

72. The Merrow Butted Seam—A 16-page booklet defining and illustrating the Butted seam, describing its properties and outlining some of the advantages to be gained by its use in Textile fabrics. The Merrow Machine Co., Hartford, Conn.

77. Bulletin S 200—Illustrating and describing the new Reeves Variable Speed Drive for spinning and twister frames, explaining its many distinct advantages and giving charted results of exacting tests. Reeves Pulley Company, Columbus, Indiana.

88. Dayton Cog Belt Catalog—A 32 page booklet full of vital information on power drives, plainly and simply assembled and arranged so that anyone can select the proper standard drive for any condition. It also provides data for the calculation of drives where acquired. The Dayton Rubber Mfg. Co., Dept. C-11, Dayton, Ohio.

109. Some Properties of Starch and Dextrine—Explaining certain fundamental properties of starch and its derivatives and their action when heated and agitated. Stein, Hall & Co., 285 Madison Ave., New York City, N. Y.

110. 3-In-One Oil for Industrial Uses—showing the many industrial uses and advantages of this oil. A. S. Boyle Co., 1934 Dana St., Cincinnati, Ohio.

116. Arcy—Telling in an interesting way the story of Arcy, which completely liquefies ordinary thick boiling pearl starch and its many advantages. Drake Corporation, Norfolk, Va.

117. Anti-Friction Bearings as Applied to Spinning, Drawing and Twisting Frames—This bulletin shows with detailed drawings how a simplified design of roller bearing applications is made to replace the plain babbitt bearings and lists the advantages that are gained. It deals primarily with better continuous production and in consequence freedom from equipment care and repairs. Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.

120. Goodyear Mechanical Rubber Goods Catalog—40 page catalog giving practical information and tables helpful in the selection of the proper belting, hose or packing to suit the requirements of the mill. Goodyear Tire & Rubber Co., Akron, Ohio.

128. Houghton's Hand Book for the Hosiery Dyer—This book contains the result of 69 years of experience in research and development of processing materials for the textile industries, together with a wealth of other data useful to every hosiery dyer. E. F. Houghton & Co., 240 W. Somerset St., Philadelphia, Pa.

130. Three New Textile Scouring Agents—This 32-page book gives many valuable formulas for the use of Houghton's Wonder Powder—a new type of colloidal detergent—in fulling, scouring, and finishing nearly all types of woven and knit goods. Also contains several pages of valuable reference and conversion tables. E. F. Houghton & Co., 240 W. Somerset St., Philadelphia, Pa.

139. Textile Detergents—Theory of the use of alkalis and control of pH—This 32 page booklet explains in simplified manner for the benefit of the layman the chemical processes that take place in using textile detergent in the finishing of textile goods. It contains many useful tables and data. Detergent Products Corp., Peachtree Bldg., Atlanta, Ga.

141. V-Belt Engineering Data Book—Over 50 pages of pertinent engineering information including data on selecting a V-belt drive design of special V-belt drives, numerous standard tables, charts and belt and sheaves list prices. Manhattan Rubber Manufacturing Div. of Raybestos-Manhattan, Inc., Passaic, N. J.

152. Plant Check-up List—Crane Co., 836 South Michigan Ave., Chicago, Ill.

154. Johnson Bronze Bulletin No. 340—showing over 600 sizes Johnson general purpose bronze bushings. Johnson Bronze Co., New Castle, Pa.

155. Link-Belt Catalog 1574 on the P. I. V. Gear—giving details of this positive variable speed control. Link-Belt Co., 307 N. Michigan Ave., Chicago, Illinois.

156. Link-Belt Engineering Data Book No. 125—showing features and giving engineering data on Link-Belt silent chain drive. Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

157. Grading Rules and Complete Specifications for Laying and Finishing Maple Floors—Maple Flooring Manufacturers' Association, 1794 McCormick Bldg., Chicago, Ill.

163. Roto-Koner—Bulletin describing the new No. 44 Universal Winder, known as the Roto-Koner for winding knitting yarns, which has many new and distinctive features. Universal Winding Company, P. O. Box 1605. Providence, R. I.

164. Johnson Rotary Pressure Joints—Bulletin describing the rotary pressure joint which requires no packing, no lubrication and no adjustment, giving installation and maintenance instructions, types, sizes, dimensions and prices. The Johnson Corp., Three Rivers, Mich.

166. Precision Winding—An interesting 30-page booklet on rayon yarns and winding, designed for weaving and finishing mills using silk and rayon. Universal Winding Co., P. O. Box 1605, Providence, Rhode Island.

168. The Tube-Tex for Tubular Knit Goods—Bulletin describing this modern machine which extracts, processes, dries, conditions and folds in one continuous operation, lowering costs, saving labor, power, space and waste. H. W. Butterworth & Sons Co., York and Cedar Sts., Philadelphia, Pa.

170. Gates Textile Accessories—showing the increased efficiency and economy to be secured through the use of Gates cone belts, evener belts, card bands and loom binder cushions. The Gates Rubber Company, Denver, Colo.

171. Design of V-Belt Drives—48 page booklet full of valuable tables and data showing the type, number and design of V-belts that will give the greatest efficiency on each particular drive. The Gates Rubber Company, Denver, Colorado.

176. Sonoco Products—A 60 page illustrated booklet giving descriptions, specifications and charts of the many Sonoco products, including bobbins, cones, tubes, cork cots, roving cans, spools, rolls, etc. Sonoco Products Co., Hartsville, S. C.

184. Speed Control Handbook T-35—uew reference book in variable speed control, said to be the most complete and helpful book on this subject ever published. 112 pages and more than 200 illustrations of interest to every production executive, purchasing agent, superintendent, overseer and master mechanic. Reeves Pulley Co., Columbus, Ind.

185. Dulux—The White Finish That Stays White—New book describing the new ten-point finish for factory walls and ceilings, the finish that stays whiter, stays cleaner and stands repeated washings. E. I. du Pont de Nemours & Co., Finishes Division, Wilmington, Del.

186. F 7, Feeder Bulletin — Describing the better blending that is secured and the important cleaning operation that is added by using F-7 feeders in place of bale breakers. Saco-Lowell Shops, 147 Milk St., Boston, Mass.

187. The Wildman Single-Head Full-Fashioned Hosiery Machine—Literature on request from the Wildman Mfg. Co., Full Fashioned Division, Norristown, Pa.

188. Form 374—This form enables you to gather your own cost data on your sewing machines and determine whether new Union Special Machines will show big savings. Furnished free by Union Special Machine Co., 400 No. Franklin St., Chicago, Ill.

191. The Bahnson Humidifier—bulletin describing Bahnson Humiduct system which combines humidifying, heating, ventilating and air conditioning all in one unit, will be sent free on request. The Bahnson Co., Winston-Salem, N. C.

COTTON, Grant Bldg., Atlanta, Ga.

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The high output of the Proctor Automatic Boarding Machine for Hosiery, can be accomplished by two "boarders" with the greatest of ease. Important among the many special features that make this production with superior quality results possible is the Automatic Stripper—a unique device that assures gentle, accurate and perfect stripping of the stockings from the boards. All the features of this new automatic machine combine to bring high production while safeguarding and actually improving the good work of the operators. And, remember, that the modern Proctor Automatic Boarding Machine occupies only 9½ x 11½ feet of floor space! Ask for Bulletin No. 240 which will give you complete details.

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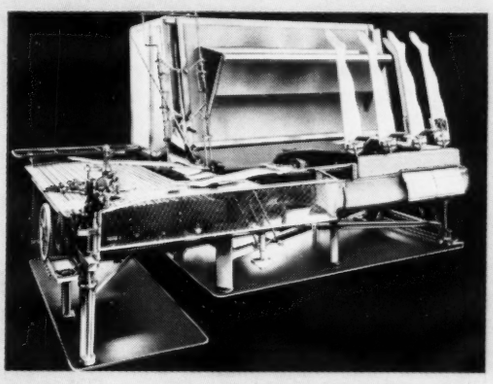
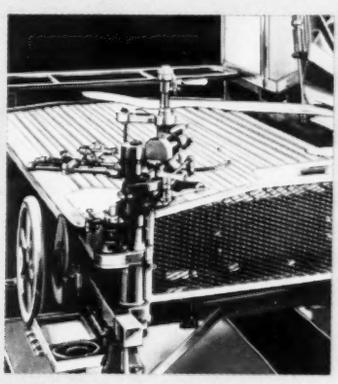
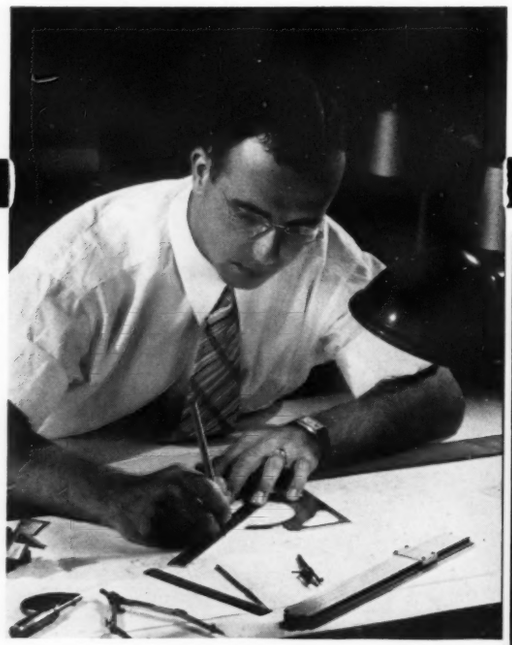




Shown at right is a close-up of the Automatic Stripper.

PROCTOR *Automatic* BOARDING MACHINE



GUIDING SPIRITS IN BUILDING EFFICIENT KNITTING MACHINES

KNITTING efficiency depends on the accuracy with which machines are made—and accuracy starts in the drafting rooms. At Scott & Williams draftsmen and engineers trained to think of mechanical drawings in terms of knitting efficiency are the guiding spirits in the manufacture of all knitting machines and parts.

Before production is begun on a part or attachment it is drawn in detail complete in actual dimensions. From this drawing the engineering department supervises the building of a master sample, which is the standard for all subsequent production of this part. This department also plans the various steps in its manufacture and is the central authority on all matters pertaining to accuracy in measuring up to standards.

Thus, the manufacture of not only new parts but of **all** parts for Scott & Williams machines is always under the control of precision-minded engineers who are the originators and planners of work throughout the entire factory.

When you buy Scott & Williams replacements you can be sure that you are getting **accurately engineered** duplicates of the parts to be replaced. And when you use Scott & Williams machines you can see, in the knitting they produce, the precision quality for which they are noted throughout the knitting world.

Established 1865

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KNITTING SECTION

Defect in Sample Hose

By a Member of the Staff

WHEN ONE of our friends in a full-fashioned mill answered a question submitted by another mill man recently, he also stated that he had run into a little trouble of his own, which, previous to this experience, was entirely unknown to him. We happen to know that this mill man has been in the business a long time and that he has seen plenty, so naturally we became immediately interested in any problem that is new to him. He sent us a pair of stockings which showed a small napped area or scuffed-up place on the right side of the toe on the finished stocking, or the left side of the unfinished pattern. This trouble had flared up almost suddenly and in a rather alarming way.

The sample of hose was shown to or sent to several other manufacturers of full-fashioned hosiery, the first of whom replied briefly to the effect that the work should be checked over to see that it is getting enough knocking over—that the height of the needle bar is correct. Also there might be a possibility that the narrowing machine is too pointed and should be straighter instead of at too much of an angle. Again, it is possible that the scuffed-up places were caused when there was a strain on the narrowing machine. It would be difficult to say just what is causing defects of this kind without seeing and inspecting the machine on which the fabric was made. A machine might make the defect when set a certain way, but another machine set in the identical manner would make perfect fabric, or have a defect entirely different.

The next man to whom the sample was shown turned it inside out and examined it thoroughly and then opined that this condition *could* have been caused by bad silk. "It looks as if the tension on the side was loose and the knitter let it load up on the needles. That is, the take-up strap was loose causing a loading-up condition on the needles. There are many things that will cause it; this particular condition is possibly a result of chafed silk. It would be misrepresenting the fact to try to say exactly what is the trouble without analyzing the sample." As we wanted the sample to show to other men, this was not done. Other possible causes for the defect were named as the sinkers running under the yarn, or not having enough lead on the yarn. The catch bar cams may have been out of adjustment also.

The following man who saw the sample said that it looked as if the narrowing machine was out of adjustment, being too far out at the bottom. This will cause the narrowing points to strike the needles too much on the point and then the needles can not back properly through the stitch, causing them to split the stitch—giving the napped effect. He also said that the knocking-over may be roughing the stitch. Elaborating, he said that at this point, the toe, the work does not have as much weight on it as at other places. Some mills have the knitters remove most of the weight by the time the stocking goes into the toe; if the knitter would take off half the weight on the change that he had been taking off, and then remove the remainder of the weights after the fabric has run down about one-third of the toe, he might correct this defect without changing the adjustment on the narrowing machine. In other words, the removal of the weights should be gradual in-

A portion of the defective hose, showing a small napped area or scuffed-up place on the right side of the toe on the finished stocking, or the left side of the unfinished pattern . . . . . .

stead of at one time.

Another manufacturer of full-fashioned hose inspected the sample and gave several reasons that may have been the cause of this fault in the stocking. "It may be caused from a little roughness on the narrowing points, or by a bit of coated rust, or by scratches on the points. I have seen this caused by the sinkers—the catch bar was setting too far forward. Too much press on the needles would cause the work to hang on the sinkers as it comes off. If the points and needles don't come together at the right place in the narrowing operation the same defect may result." He then explained that when a fixer is looking for such a defect as this, he will discover much more than just what he is looking for; much on the same principle that if your automobile is left at the garage for the horn to be repaired, the mechanic will find several other defects in the engine that "should be fixed or the car may break down on the road." However, in looking over a machine it is always well to have something to look for or many maladjustments present may be ignored.

When the sample was passed to another prominent mill man he glanced at it and immediately said, "We had some trouble just like this when we had a Bemberg plaited toe; this was caused by the Bemberg getting too wet. It is possible that the needles and sinkers chafed the yarn until it got to the heavy part and then it did not chafe it any more. If the defect is caused by the Bemberg, then it may be corrected by running it just as dry as possible. On our Bemberg we run it one thread lighter and just as dry as we can get it. Water makes Bemberg soft." He also explained that the narrowing points should have the proper angle to the needles at all times to avoid this defect, even when not using Bemberg yarn.

After putting the sample of hose under a glass and inspecting it, another man said that the defect could have been caused by the use of silk that has been slightly on the acid side, which roughened or pitted the narrowing points so that in the narrowing operation of transferring the loops from the needles to the narrowing points, and from the narrowing points to the needles, instead of drawing through the loops smoothly, there is a tendency to pick the silk and from this produce a rough appearance. It could also be caused by the narrowing points not being smooth to make a clean penetration into the loop. He then told of having a hygroscopic silk run in his plant that had a chemical in it which turned the needles black. With this possibility in view, he suggested that the manufacturer having the trouble with his hose being napped run one machine, having this condition prevalent, on cotton yarn, 50s or 60s, with a solvent on the needles to clean them. Cotton is absorbent whereas silk is repellent. By running the cotton the needles will become clean. Of course in doing this the machine should be kept narrowing all the time.

This sample was again passed to a mill man, who also examined it under a glass, and who said, "It looks as if in the narrowing process there is a loading up of the needles and in the dyeing there are too many hose in the bag, causing the stitch to be chafed. The trouble is not in the formation of the stitch but is in the loading up of the needles. High turn silk will also cause this if the sinkers are worn. The high turn silk cuts the sinkers and needles. If this man increases the number of turns on the reinforcement silk it may help. If this doesn't remedy the trouble, then he should look to his sinkers and needles. Some companies use 3 turns in their reinforcement silk but we go as high as 12 turns. It might also be advisable to see if the narrowing points on the particular footer giving trouble are rough.

The next man was shown the hose and the sample was left with him for awhile. Later he wrote us that in our discussion he told us that it was a question of not enough press somewhere on the machine, or in other words, at a certain point of the operation the wales formed by several ends were not taken in completely under the beard of the needle so as to make a clear stitch, but part of these threads were passing over the beard wing because of lack of press at some point, during the formation of the wale. This was plainly noticeable. Later in the day he showed this sample stocking to one of his fixers and both of them analyzed it thoroughly. Their findings are as follows:

First we noticed that these peculiar defects only occurred in or during the narrowing motion; that even though one side of the stocking had many more of these free laps, there were also some on the other side. We also noticed some during the gusset narrowings. Thus it was proved that the napped places were only caused during the narrowing operation. From further check and past experience we believe that these loose loops or wales are caused by the narrowing points not meshing properly with the needles during the narrowing motion. During this meshing of the point with the needle, the point of the narrowing point does not press into the groove of the needle, thus letting a few of the threads slide in between the point and the needles. See Fig. 1.

Many times this is caused by the knitter using his pliers to remove the hook off the points. In other words, he makes the point of the narrowing point too straight. This is illustrated in Fig. 2. The proper method is shown in Fig. 3. To prove this is

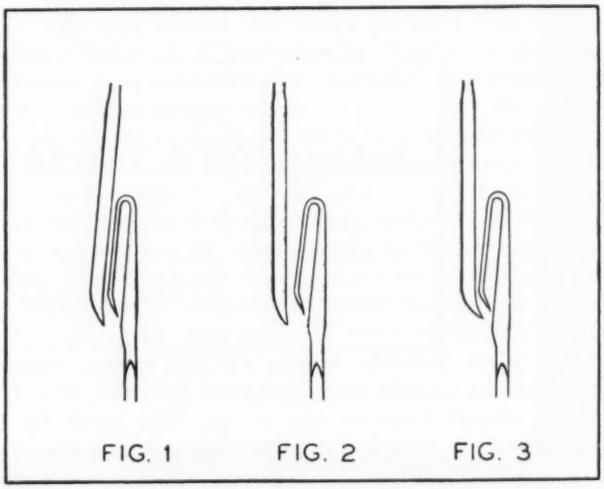


FIG. 1 FIG. 2 FIG. 3

true on this particular stocking, where one side is much worse than the other, the fixer can loosen the narrowinger on the narrowing rod, take a little strip of paper 1/16-inch to 1/8-inch wide, and put it behind the narrowing finger. In other words, when loosening the narrowinger finger on the narrowing rod, ease the narrowing finger a little away from the rod and slide this piece of paper between the finger and the rod below the screws or at the bottom of the finger, and then tighten the finger on the rod again. This procedure is illustrated in Fig. 4.

This will change the pitch of the narrowing finger so that the point of the narrowing points will mesh into the groove of the needle much better. The thicker the piece of paper the greater the change in the pitch of the finger.

The explanation given is just to prove that this is what is causing the trouble. If by doing this the trouble is eliminated on the particular head and there is still some evidence of this defect on the rest of the machine as the sample of stocking would have us to believe, we then recommend that the pitch on the whole machine be re-set so that the narrowing points will mesh the needles properly during the narrowing operation.

According to the looks of this stocking, my recommendation is that the narrowing machine should be moved a little forward at the bottom, of course, with the understanding that the points are pliered properly and have their proper hook on the point of the narrowing point.

Still another full-fashioned manufacturer wrote us that he had examined the sample of hose which we sent him: "The defect in this stocking appears only in the fabric that is included in the narrowing process and this indicates that it is produced by the narrowing points or the combination of narrowing points and the needles in the narrowing process. In the right side sole narrowings the stitches that were moved by the fourth narrowing point in the large finger have this defect and the same condition exists in the stitches in the toe that were shifted by this same point. If this defect were produced by a needle or needles it would move out two stitches nearer the selvage at each narrowing, both in the sole and in the toe. Due to the fact that it remains in the same wale in the sole and shifts out only one stitch at each toe narrowing, I would say that it is produced by

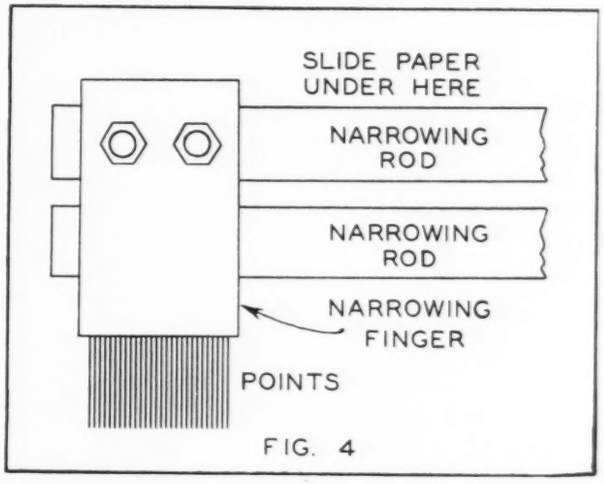


FIG. 4

the narrowing points. It is my opinion that the narrowing points are snagging the stitches as they enter them to remove them from the needles. This could result from the needles and narrowing points not coming together hard enough, not coming together at the right time, or from rough points caused by the machine standing idle for some time, or failure to lubricate the points on the back side. The narrowing machine may be adjusted to a position that is on the borderline between correct and incorrect and still produce good results unless some factor enters, such as the fabric sagging on the sides while the set is on the machine; that will affect the results. This might account for the defect in this stocking appearing at the start of the toe and not near the end of it."

It is not always possible to write the last chapter of such a series of discussions as took place concerning this sample of hose. However, the manuscript containing all of the replies was sent to the contributor who had submitted the sample. He wrote us as follows:

"In the matter of our problem of faulty places in the toe, I may say that we found the replies very interesting and handled in a very thorough way, practically covering our experience in eliminating the trouble, which we found to be caused by two conditions, first, the narrowing machine was set a little too low, and second, there were some rough narrowing points. Adjusting the narrowing machine and thoroughly polishing the narrowing points eliminated the trouble."

◆◆◆

Knitting Patents

Nebel Knitting Company, of Charlotte, has had two patents awarded to it, according to Paul B. Eaton, patent attorney, of Charlotte, N. C.

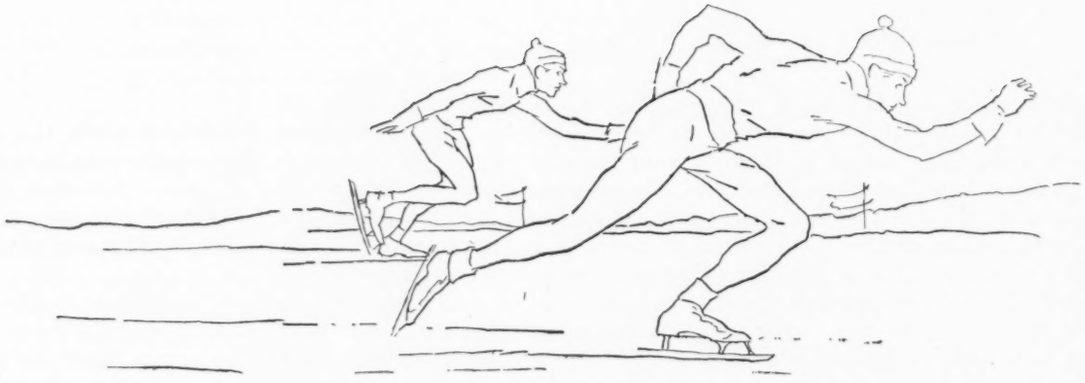
These patents were invented by employees and assigned to the company, one being an invention of W. L. Griffin, Sr., for a structure for boarding and drying hosiery wherein means are provided for preventing the elastic tops of the stockings from jumping forwardly at too great a rate when the stockings are being removed from the forms.

The other patent awarded to this company was on an invention of Robert A. Folkman and relates to a stocking having a double welt portion, a shadow welt portion, and a sheer leg portion, with the yarns between the last two portions being inter-knitted and overlapped and with a re-enforcing area at the back side of the stocking at the junction between the sheer leg portion and the shadow welt portion. These features provide re-enforcement points where defects in sheer full-fashioned silk hosiery are accustomed to occur.

◆

The more we know about the temperament, the characteristics, the ambitions, and the habits of each of our men, the more accurately we can pick a man for a particular job when the need arises.

—"Management Information".



As the race for profits in the making of full-fashioned silk stockings becomes more and more a race for *technical superiority*, the demand for "T M W" Needles (and the service back of "TMW" Needles) shows a strong and steady increase.

"T M W" NEEDLES

TEXTILE MACHINE WORKS, READING, PENNSYLVANIA

"Straws float on the surface; for pearls you must dive below"
ANONYMOUS

In a 40-hour week the new READING high-production twenty-six section forty-five gauge full-fashioned knitting machine produces 97 per cent more volume and 116 per cent more value than the ordinary eighteen-section forty-two gauge machine.

TEXTILE MACHINE WORKS • READING, PA.

KNITTING KINKS

Operating and Fixing of S & W Model ES Machines

(Article 4)

By Emmett Starr

THIS is the fourth article in a series concerning the care, operation, and fixing of the Model ES machine.* The series is written with the assumption that the reader has before him a copy of the S&W catalog of parts pertaining to this machine so that he can follow each plate as mentioned in the article. Save your copies of the magazine so that you will have the series complete. Should you wish any particular phase of fixing discussed, the author will be glad to do so upon request through the editors . . . . .

Clearing Cam Thrust Bar and Front Raising Cam

CLEARING CAM THRUST BAR (200449) on the left side of the machine, next to the drum levers, located in the first slot of the lower guide plate on the stitch regulating lever shaft, is connected to the upper end of the clearing cam operating lever (100238ay) on Plate 10.

The upper end of the clearing cam thrust bar is connected to the thrust bar pin (300241) on Plate 10 located on the upper left side of the clearing cam operating lever and held in place by cotter pin (15853).

The clearing cam thrust bar and the clearing cam operating lever control the action of the front raising cam (14442) on Plate 19. This action is governed by the fourth race of drum cams on the pattern drum. This race has one height of drum cams, being 7/16-inch. When clearing the cam thrust bar rests on the drum cam, the front raising cam is out of action, and when not resting on any drum cam, the front raising cam is in action.

The clearing cam thrust bar spring (6609) is fastened to the clearing cam thrust bar and to the spring hook located on the lower guide plate. This spring must be strong enough to hold the clearing cam thrust bar down, to offset the strain on the raising cam due to the needles riding over it when the raising cam is in action. The purpose of this front raising cam when in action is to raise the needles high enough so that the stitches will be shed or cast off of the latches. The front raising cam is in action from the start of the stocking to the heel and is taken out of action during the heel and then goes in action after the heel is made and is not removed from action until the start of the toe.

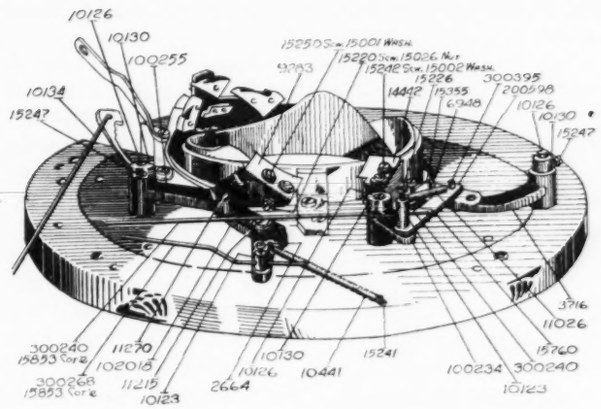
The front raising cam (14442) on Plate 19 is fastened to the front raising cam bracket (3716) on Plate 19 which swings on the front raising cam bracket stud (10126) also on Plate 19. This stud is located in front on the top bed plate. The front raising cam bracket is held down by the front raising cam bracket stud collar (10130) on Plate 19. This collar when fastened on the stud should hold the front raising cam bracket down firmly to the top bed plate, but still allowing the front raising cam to swing on the stud freely. The stop screw (15355) on Plate 19 in the front raising cam bracket should be adjusted so that it will not allow the front raising cam to rub against the cylinder. If the stop screw is not set properly, and the front raising cam rubs on the cylinder, it may cause the cylinder walls to become damaged. It is good practice to knock off the sharp points or edges of any cams which may come in contact with the cylinder. By doing this, any cams that do press against the cylinder will not be likely to wear a groove or damage the cylinder walls (13263) on Plate 20.

The stop screw is held in place by stop screw lock (15760) shown on Plate 19.

The front raising cam bracket is connected to the cast-off cam lever (100234) Plate 19 by front raising cam connecting link (200598). One end of the link is fastened to the cast-off cam lever by cast-off cam lever stud (10123) on Plate 19 and the other end is placed over the pin (6689) on Plate 19 located on the front raising cam bracket. This end is held down by spring (11026) Plate 19 which fits in the groove of the pin, so that the spring cannot slip off of the pin. The other end of the spring is fastened to the cast-off cam lever stud screw (15226) shown on Plate 19 located in the top of the cast-off cam lever stud.

The cast-off cam lever swings on cam lever stud (10126) on Plate 19 located on the left cam ring (4249) Plate 17, held down, but not too tightly by cam lever stud collar (10130) on Plate 19. The cast-off cam lever is connected to the clearing cam operating lever (100238ay) on Plate 10 by cast-off cam lever rod (300240) on Plate 19. The rear end of rod, being bent at right angles, is inserted into the lower opening of the clearing cam operating lever and is held in place by cotter pin (15853) Plate 19. The front end of rod is inserted through the opening in the cast-off cam lever stud and held or fastened by

*The first article appeared on page 108 of the August issue, the second on page 123 of the November issue, and the third on page 112 of the December issue. Thus far discussed are the upper guide plate, the gap closer shaft, stitch cam operating levers, stitch regulating lever shaft, pattern drum, pattern drum friction, drum levers, and other important parts.



The above illustration is of Plate 19 in the first, second, and third editions of S & W Model ES catalog of parts. However, in the forthcoming revision of the catalog this plate will be Plate 18 . . .

cast-off cam lever stud screw (15226) Plate 19.

The adjustment of the front raising cam bracket is accomplished by sliding the cast-off cam lever stud forward or backward on the cast-off cam lever rod.

When it becomes necessary to remove the needles from the cylinder, it is best to release the spring and the connecting link from the pin on the front raising cam bracket, and swing the front raising cam bracket away from the cylinder. This will give enough room to remove bad needles and to replace them with good needles without any difficulty. At the same time, the fixer is not as likely to bend the needles, thus saving time and work in lining up the needles after they are in the cylinder.

Be certain that the front raising cam bracket is set back in position. Connect the connecting link to the pin and put the spring back on the pin just as soon as all needles are in the cylinder. Failure to do this will cause the stitches not to cast-off of the latches, thereby causing a load up on the needles, which may or does practically damage all the needles in the cylinder.

Raising Cam Thrust Bar, Raising Cam, and Left Lowering Cam

The thrust bar located in the second slot from the left on the lower guide plate, on the stitch regulation lever shaft is the raising cam thrust bar (200448) Plate 11. The upper end of this thrust bar is connected to the clearing cam operating lever (100238by) Plate 10 similarly as the clearing cam thrust bar is connected to the clearing cam operating lever. The only difference is that it is fastened on the right side of the clearing cam operating lever, while the clearing cam thrust bar is connected to the left side of the clearing cam operating lever (100238ay) Plate 10.

The raising cam thrust bar when connected to the clearing cam operating lever controls the action of the raising cam (14435) Plate 19 and the left lowering cam (14436) Plate 19.

The fifth race of drum cams, on the pattern drum, consisting of two different heights, ¼-inch and ⅜-inch, governs the action of the raising cam and the left lowering cam. When the raising cam thrust bar is on the ¼-inch drum cam, the raising cam and left lowering cam are out of action or in neutral position; when resting on the ⅜-inch drum cam, the left lowering cam is in action and the raising cam is pulled a little farther away from the cylinder. When the thrust bar drops off the drum cams onto the pattern drum, the raising cam is put into action while the left lowering cam is pulled farther away from the cylinder.

One end of the raising cam thrust bar spring (6609) Plate 11 is attached to the raising cam thrust bar and the other end to the spring hook located on the lower guide plate. This spring assists the raising cam thrust bar to hold the raising and left lowering cams to their various positions.

The raising cam is located on the front end of the raising cam bracket (3709) Plate 19, fastened to the bracket by raising cam screws (15250) Plate 19 and raising cam washers (15001) Plate 19. The raising cam adjusting screw (15220) Plate 19 is located just beneath the raising cam in the raising cam bracket and held in place by raising cam adjusting screw nut (15026) Plate 19.

The raising cam bracket swings on raising cam bracket stud (11215) Plate 19 located on the left cam ring. This stud, when tightened to the cam ring, should allow the raising cam bracket to swing freely and yet to have very little up and down play.

The rear or back end of the raising cam bracket has a "U" shape opening in which the stud (6689) Plate 19 located on the under side of the left lowering cam bracket (10255) Plate 19 fits into. This governs the action of the left lowering cam. As the front raising cam is pulled outward, the left lowering cam moves inward and when the raising cam moves in towards the cylinder the left lowering cam moves away from the cylinder.

On the front end of the left lowering cam bracket is the left lowering cam (14436) Plate 19. This cam is fastened to the bracket by left lowering cam screws (15250) Plate 19 and left lowering cam screw washers (15001) Plate 19. Under the left lowering cam, in the left lowering cam bracket, is located the stop screw (15220) Plate 19 and the stop screw nut (15026) Plate 19. This stop screw is set, to permit the left lowering cam when in action, to lower the medium and long butt needles, but to let the short butt needles pass in their regular position. The rear or back end of the left lowering cam bracket swings on the left lowering cam bracket stud (10126) Plate 19, located in the rear of the left cam ring. The lowering cam bracket is held down to the left cam ring on the stud by the left lowering cam bracket stud collar (10130) Plate 19, which is fastened on the stud by the left lowering cam bracket stud collar screw (15247) Plate 19. This stud collar, when fastened on the stud, should hold the lowering cam bracket down onto the left cam ring but allow it to swing freely on the stud.

The raising cam operating rod (300268) Plate 19 connects the raising cam bracket to the clearing cam operating lever. The rear end of the rod is bent at right angles and is inserted in the lower opening of the operating lever and is held in place by rais-

ing cam operating rod cotter pin (15853) Plate 19. The front end is inserted through the stud (10123) Plate 19 located on the left end of the raising cam bracket and held in place by stud screw (15277) Plate 19. The adjustments of the raising cam and the left lowering cam are made by sliding the stud on the raising cam bracket either forward or backward on the raising cam operating rod. When the proper position of the raising and left lowering cam have been determined, be sure to tighten the stud screw in the stud to the operating rod.

The raising cam bracket spring (10441) Plate 19, has one end fastened to the top bed plate by raising cam bracket spring screw (15241) Plate 19 and the other end attached to the spring hook (2664) located on the raising cam bracket; this insures more positive action of the raising cam and the left lowering cam.

The raising cam is used only when making the gusset toe. The left lowering cam is used to draw the .338 butt or medium butt needles and the .390 butt or long butt needles under switch cam when going into the heel or toe, and is also used in lowering the gusset needles when making the gusset toe.

The making of the heel and toe on the ES machine is accomplished with the .338 butt length and the .390 butt length needles; on the other types of Scott & Williams machines the heel and toe are made with the .290 butt length or the short butt needles.

The needle set-up on a 220-needle machine in making the gusset toe is as follows. The heel and toe side has 26 medium or .338 butt length needles in the center for the width of the gusset end. This group is flanked on each side by 28 long or .390 butt length needles which are operated by the raising cam and left lowering cam to make the gusset. On each side of the .390 butt length needles there are fourteen .338 butt length needles, making a total of 110 needles for the heel and toe side. The instep has one hundred and six .290 butt length needles and flanked on each side with two .255 butt length needles. The .255 butt length needles are used for inserting and removing the splicing yarn.

The action of the raising and left lowering cams are as follows: After the main drum rack which inserts high splice yarn, a preliminary rack 7/8-inch long is taken to advance the drum; this rack is followed by an auxiliary rack about 1/2-inch. The auxiliary rack inserts the left lowering cam, which draws the medium and long butt needle under the point of the switch cam. After this auxiliary rack, a main rack 1 29/32-inch is made, and then the change is made going into the heel. At the finish of this rack the left lowering cam is taken out of action.

The short butt needles should be uniform in length so that the stop screw in the left lowering cam bracket can be adjusted, allowing the lowering cam barely to touch the short butt needles without drawing any of them down, and to be more positive in drawing the medium needles down.

The left lowering cam does not go into action again until a 1 13/32-inch rack is taken to change the yarn for the ring toe, and it remains in during the ring toe. A 1¼-inch rack changes into the toe and at the end of this rack it is withdrawn from action.

When the right- and left-hand lifters (4486 & 4487) or up-picks have raised the fourteen .338 butt length needles on each end of the toe and the twenty-eight .390 butt length needles which are the gusset needles, a 1 11/16-inch rack lowers the gusset needles by the lowering cam going into action and another 1 11/16-inch rack raises the gusset needles by the raising cam. This last 1 11/16-inch rack puts the dropper (12470) Plate 12 into action. When the dropper has taken down the gusset needles and the .338 butt length needles, a 7/16-inch preliminary rack advances the drum and the following auxiliary rack advances the drum only. The following rack, which is a main rack, goes off of the toe.

When changing from gusset toe to plain toe, the needle set-up, main and auxiliary racks all remain the same. Remove the fifth race of drum cams on pattern drum between the end of the main rack; that changes from the ring toe to the toe to the end of the main rack which raises the gusset needles. Set the raising cam adjusting screw in far enough so that when the raising cam thrust bar drops off of the ¼-inch drum cam, it will not allow the raising cam to come in contact with the gusset needles. Do not fail to tighten the adjusting nut on the raising cam adjusting screw. Failure to tighten this nut may allow the adjusting screw to work out and let the raising cam *in* during the operation of the toe, causing a very serious smash-up. To be sure that the raising cam will not come in, even if the adjusting screw does work loose, replace or fill up that space with ¼-inch, height drum cam.

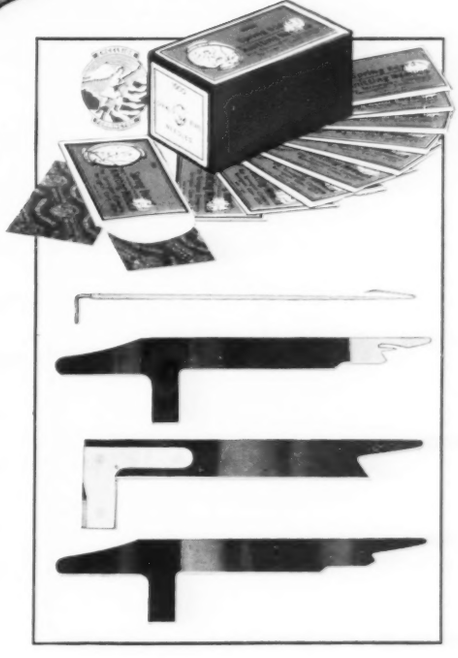
Oiling Spiral Machines

IN ANSWER to the inquiry, "We would like to know the best method of oiling the needles, sinkers, and jacks on spiral knitting machines. Also, what viscosity should a lubricant be for this purpose?", COTTON received the following answer from a mill executive.

The spiral machines we have and operate are the internal welt type for making tops for full-fashioned hosiery. These machines are 4½-inch and 4¾-inch diameter and have from 380 to 474 needles. They operate the same as the regular size which make a complete stocking.

I believe our lubricating problem is greater because the cylinders are larger and have more needles, sinkers, and jacks in operation. Also, our machines run 16 hours a day. We have found that in order to eliminate floating stitches in the fabric, other than the regular pattern stitches, it is necessary to put quite a bit of friction on the pattern jacks, and the more friction there is the more heat is generated.

We have experimented with all kinds of oils and I believe the oil we are using now is the best for all purposes. We use the same oil for the sinkers and needles and jacks, which I believe is a good method

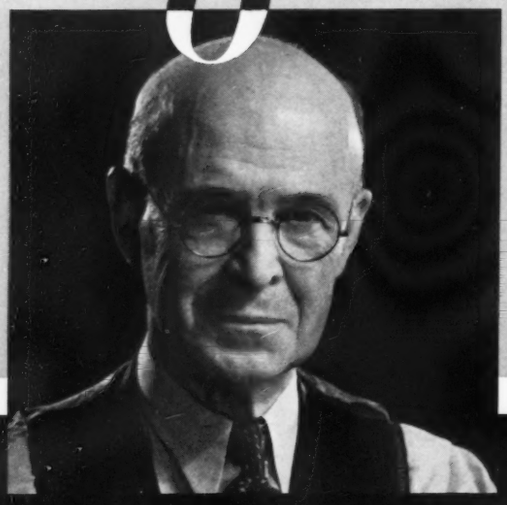


"THEY'RE KNIT SO TRUE," says one manufacturer in telling women of the advantages of his high quality line of hosiery. "Luxuriously sheer," says another of his line. "Subtly sleek," says a third. Necessary, desirable qualities all. Modern women demand and expect true fit, sheerness, sleekness —other fine qualities, too. Torrington Needles—the *modern* needles—are *machine-made* to help you give your hosiery these selling features. Machine-finished to protect your yarn. Machine-tempered to keep your knitting true. Machine-tested to give you uniformly high knitting standards. Use Torringtons. They will help you create hosiery that will keep your customers sold!

TORRINGTON *Needles and Sinkers*

18.2% replied . . .

"PROVED BEST" when asked* — Why Do YOU Use Torringtons?



PROVED BEST means that in the experience of users, Torrington Needles have shown themselves to be consistently superior in fineness of temper, smoothness of finish and uniformity of dimension—all of which contribute to efficiency and economy in the production of high quality knitted fabrics.

★ **MILL MEN'S REASONS FOR PREFERRING TORRINGTON NEEDLES**

Proved Best	18.2%	High Quality	12.5%
Best Service	17.0%	Better Temper	9.0%
Best Results	15.9%	Last Longer	6.8%
Most Uniform	14.8%	Economy	2.3%
Best Made	13.6%	Smooth Finish	2.3%
Most Satisfactory	12.5%	Miscellaneous	11.4%

Many of the knitting mill executives surveyed gave more than one reason under the above classification for preferring Torrington Needles. As a result the figures for the entire list total more than 100%.

Every year brings new standards of knitting quality . . . and an increased demand for finer needles. Torringtons, the machine-made needles, are the answer to this demand.

IN A RECENT survey conducted by an independent market research organization among users of Torrington Needles in the knitting industry, 18.2% of the executives questioned said they preferred Torringtons because they had "Proved Best".

This was but one of the many reasons given for preferring Torringtons. Among the replies received are such constantly recurring phrases as "last longer". . ."more reliable". . ."best for our particular purposes". . ."best made". . . "better temper". . ."more economical". . ."they do better work".

The customer satisfaction these replies reveal springs from specific features of superiority that Torringtons possess—finer temper, smoother finish, greater uniformity—all made possible by the unique *machine* manufacturing methods Torrington has developed to insure needle quality.

THE TORRINGTON CO., TORRINGTON, CONN., U. S. A.

The Torrington Company . 1640 Fairmount Ave., Phila., Pa.
The Torrington Co., Inc. . 200 Fifth Ave., New York, N.Y.
The Torrington Company . 538 South Wells St., Chicago, Ill.
The Torrington Company . Guilford Bldg., Greensboro, N.C.
E. G. Paules . . . . . Bendix Bldg., Los Angeles, Calif.
The S. M. Supplies Co. . 210 South Street, Boston, Mass.
The Torrington Co., Ltd., 137 Wellington St. W., Toronto 2, Ont.

Factories at

Torrington, Conn. — Coventry, England
Upper Bedford, Quebec — Aachen, Germany

TORRINGTON *Latch Needles*

Arcadia Hosiery Mill Operating 40-Section Footing Machine

A 40-section full-fashioned hosiery footing machine is in productive operation at the Arcadia Hosiery Co., Lansdale, Pa., the mill made known recently.

The machine, understood to be the first in the industry to produce 40 stockings in a simultaneous operation, is the result of coupling together two 20-section footers. The company is now engaged in coupling up two more 20-section machines. Eventually, all machines in the plant will become 40-section, according to plans made known.

The major economy resulting from this innovation is in labor cost. Ordinarily, a 20-section footer calls for a knitter and two toppers; the 40-section machine required a knitter, a helper and four toppers. With two 40-section machines set up in one aisle, their operation will call for two knitters, two helpers and seven toppers, as stated by the mill.

Other economies on the machine are the elimination of one ringless attachment, one pointex and other parts. The length of the consolidated machine is approximately 57 feet—three feet shorter than two 20-section machines. The two motors are synchronized, and operate with a single control.

It was estimated by this mill that the cost of consolidating the two 20-section footers did not exceed $400, including labor as well as material. Set and in resumed production in less than two weeks' time, the lengthy machine did not require dismantling of the two shorter machines. Special parts needed to effect the consolidation were made by the mill.

The enlarged machine effects no change in production, according to the Arcadia Company. The machine presently running, engaged on plaiting work, averages 58-60 courses per minute. It is said to have reached 62 courses. The possibility of attaining 65 courses per minute is seen with the elimination of present friction.

The two machines composing the consolidated machine are Reading 42 gauge long-needle, with serial numbers 4800 and 6117—said to be from 14 to 17 years old.

Production on the 40-section footer is said to be about 70 dozen per eight-hour shift, using "Flexy" carriers.

The idea of the consolidation was conceived and worked out by Frank Weisbecker, also inventor of the "Flexy" carrier and the flexible tube. Although there is no patent on the joining of the machines, patents have been applied for on some automatic features.

and saves the fixer or oiler the job of oiling twice. We start on our machines the first thing in the morning and start oiling right away. We put a small amount in the sinkers and a good amount to the needles and more on the jacks as they are the ones that cause the most trouble if not lubricated enough. This first oiling is done by the fixer—or oiler if there is one. For the remainder of the day each operator has an oil can for the set and if a machine is running hot he oils with the same type of oil. When the next shift starts it goes through the same procedure.

We have a few other ideas which we believe are helpful in lubricating the machines. In the summer months when the temperature is up to about 100 degrees F. we apply pure white petroleum jelly on the jacks and needles about once a day. During the winter, especially when the mill has become cold during the night, it is helpful in getting started if the oil is heated slightly before putting it on the machine.

We use an oil that has a good body and that remains on the parts when it is applied; it is stainless. We have found that it does not pay to try saving in oil, especially if we want the machines to run with the least waste and trouble. It is also advisable to see that the operatives are not wasting the oil.

In our mill are sets of jacks and cylinders which have been running day and night for six or seven years and they are still in good condition.

CONTRIBUTOR No. 6874

Lastex has been introduced in many branches of the textile industry, but the part in which it has played increasing importance is the manufacture of hosiery of various types.

Every mill should employ a check-up system on all incoming shipments of needles and points to help eliminate the hazard of defective parts reaching the machines.

Remedies Foot Defect

EDITOR COTTON:

For some time I had trouble on S & W Model K machines with the heels and toes sticking up between the sinkers and dial. My question giving all the necessary information to allow other men to assist me in my problem was published on page 120 of the June 1938 issue of COTTON, and subsequently I received many helpful suggestions through the pages of the "KNITTING KINKS" department. I wish to express my appreciation for these opinions offered. Believing that I have discovered the trouble, I will pass what has been found along to other readers of your paper.

Our trouble was mostly due to having a yarn that was too heavy in the heels and toes. We experimented with different numbers of yarn; from the standpoint of cost, waste, and menders, we decided to use two ends of 60s/1 M. We found this to work the best, and changing from the two ends of 100s/2 to the 60s/1 we were able to tighten the stitch quite a bit, thus lowering the cylinder and making more room for the work to feed down.

We also shortened our heel and toe. The chain layout formerly was 10-1-10 and 13-1-13 for the heel and toe and we changed it to 9-1-9 in the heel and 12-1-12 in the toe. This made the heels and toes a little smaller; consequently there was not so much fabric to pile up between the dial and sinkers. We ran a few machines like this for about a month and did not have trouble at all. Since then we have changed all our 300-needle machines over to this layout and I believe they will work satisfactory.

On the one or two that we have found sticking up the dials were too low or there was too much tension on the yarn, making it necessary to have the cylinder too high to get the right stitch.

Again thanks to all for the assistance.

CONTRIBUTOR No. 6802

Automatic Welt Turning Is Feature on New Single Unit Full-Fashioned Machine

The manufacture of full-fashioned hosiery complete on one machine, instead of on two separate machines, has occupied the interest of hosiery mills and machine manufacturers for a number of years. Alfred Hoffmann, Inc., West New York, N. J., have made available some interesting information with respect to the Schubert & Salzer single unit machine, Type HSU, for this purpose. This machine, first introduced in 1935, produces a stocking complete in one operation. It has one-piece needle bars, the same as on the conventional legger, and a simple mechanism for varying the width of the instep to meet fashion demands.

Modern improvements embodied in the machine include short needles, large cams, hook knocking-over bits, short carriers, main carriers with replaceable tubes, 14½-inch heads, etc., and three-carrier, picot, pointed heel and lace attachment with a 40-42 needle range—this equipment is standard. A double lace attachment with a 72-needle range is also available. The operating speed of the machine is 73-75 courses per minute, depending on the yarn employed.

The manufacturers point to the automatic welt turner as an outstanding improvement on this single unit machine. The feature was first announced at the 1938 Knitting Arts Exhibition. The automatic welt turner is entirely automatic in function, and turns the welts with a loop on every needle, so that the appearance of the welts is exactly as if they had been turned manually. The device is built into the machine without encumbering its operation, it is pointed out, and with free accessibility and view of all sections retained. The welt bar in each section can be disengaged individually, rendering it possible to stop operation of any particular section at any desired point. Needles may be replaced while making the welt. No auxiliary motor is necessary in operating the device, it is explained.

The manufacturers have furnished the following brief description of the operating method of the automatic welt turner:

After the previous set of stockings has been pressed off, a loose course is made just as if the welts were to be turned by hand. The welt bars which until now remained in their inoperative position underneath the machine table cover simultaneously move over gliding rails toward the needle bars so that the welt bar hooks engage the sinker loops. (See Fig. 1.)

After the welt hooks have engaged the sinker loops, knitting of the welt is begun, and while this is taking place, the previously finished set of stockings is removed. During the knitting of the first half of the welt, the welt rods are placed into their proper position by means of a single lever while the machine is running, and all rods at the same time take up the tension of all sections. When the welt has reached the desired length, the fabric tension which to this point was controlled through the welt bar, is taken up by the welt rods. (See Fig. 2.)

The machine now continues knitting the welt and the welt bars advance towards the needles. The welt is then automatically turned (see Fig. 3.) and the welt bars subsequently return to their inoperative position. Fig. 4 shows the welt completed, and the knitting

Fig. 1.

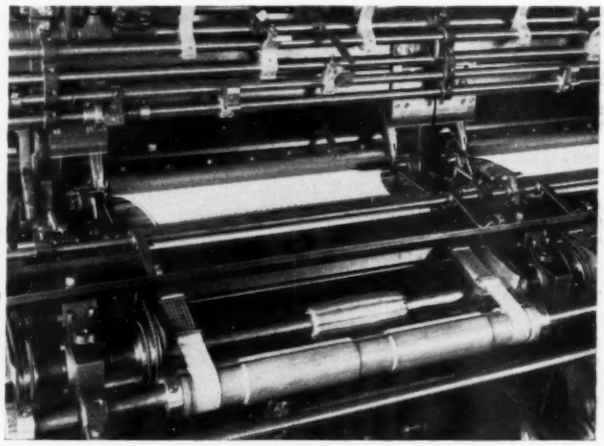


Fig. 2.

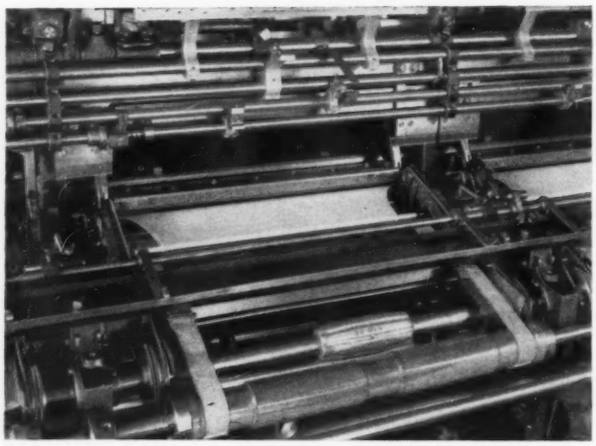


Fig. 3.

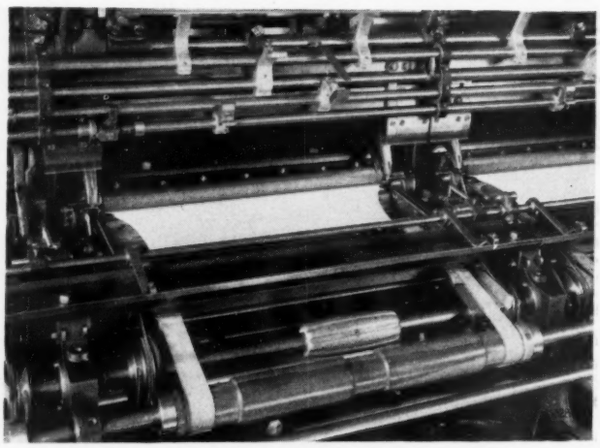


Fig. 4.

of the main fabric of the stockings has commenced.

The welt rods can now be placed in position again for the next set, while the knitting of the leg is taking place.

Any length of welt can be made, the shortest on a 51-gauge machine being 2-inch. Since the welts are turned automatically, 28-section machines are available for maximum production.

The machine is furnished with a new type of motor equipment known as the Polyspeed motor drive. It consists of a main motor, a speed controller which is constructed without moving or sliding contacts of any kind, magnetic starter combined with fused disconnect switch, a shipper rod switch, and speed selector switch-box. Tne drive furnishes very high starting torque at all required speeds, and is provided with six separate speeds, which in themselves are adjustable for various conditions.

An Eye on the Knitting Mills

Mountain Empire Hosiery Mills, Inc., have just been chartered in Richmond, Va., with an authorized capitalization of $1,000,000, to operate five hosiery mills in Virginia. J. C. Dobson, president of the Dobson Hosiery Mills, Pulaski; Homer K. Bowen and Percy S. Curry, of Wytheville, are president, secretary and vice-president. The company plans to erect plants at Bland, Lee, Russell, Washington, and Tazewell, Va.

Application for charter for Salem Industries, Salem, Va., to operate a full-fashioned hosiery mill has been filed. The Salem chamber of commerce will finance the construction of the plant, to house the Salem Full-Fashioned Hosiery Mill, Inc., to be operated by the Wallner interests and the Burlington Mills, Greensboro, N. C. Fiske-Carter Construction Co., of Spartanburg, S. C., will erect the plant.

National Hosiery Mills, Inc., Denton, N. C., have been formed with C. Bisher, Harold Bisher and Mrs. C. Bisher as incorporators. The new concern has acquired the Rogers Hosiery Mills and will operate it on misses', children's and infants' hose, with 68 machines. C. H. Dockman is superintendent.

Galax Knitting Co., Galax, Va., have purchased 24 new Scott & Williams reverse plaiting wrap machines, with attachments for laying-rubber. The installation will be completed in February, according to J. T. Pollard, President. The mill makes men's, women's and children's hosiery.

Randleman Full Fashioned Hosiery Mills, Inc., Randleman, N. C., have been incorporated by W. J. Armfield, III, W. J. Armfield, Jr., of Asheboro, and J. D. Croom, of Randleman, N. C. The building will be one-story, 142x115 feet. The mill will operate 26 Reading full-fashioned machines.

Hoover Hosiery Mills, Concord, N. C., have secured from Robert Reiner, Inc., "Einsiedel-Reiner" heeling machines which will be used with their present type leggers that have been converted to knit the single unit type of full-fashioned stocking.

Morris Speizman, machinery dealer of Charlotte, N. C., has purchased the equipment of the Priester Knitting Mills, Paducah, Ky., consisting of knitting machines, 207 ribbers, 55 loopers, 16 seaming machines and dyeing and miscellaneous equipment.

Fayetteville (N. C.) Knitting Mills have purchased additional "Einsiedel-Reiner" machines from Robert Reiner, Inc., bringing their total to 8 machines; an additional 4 machines will be delivered early in 1939.

Construction is reported under way for the plant of the William Nebel Hosiery Co., at Jacksonville, Fla. S. S. Jacobs Construction Co. are the contractors. Full-fashioned hosiery will be produced.

Davis Full-Fashioned Hosiery Mills, Burlington, N. C., have ordered a number of "Einsiedel-Reiner" high speed full-fashioned machines from Robert Reiner, Inc., delivery to begin January 1.

Caswell Knitting Mills, Yanceyville, N. C., have purchased from Robert Reiner, Inc., through A. Glenn Holt of Burlington, N. C., 15 latest type "Einsiedel-Reiner" high speed full-fashioned machines; first delivery on January 1.

Siler City (N. C.) Hosiery Mills have purchased an additional "Einsiedel-Reiner" high speel heeling machine, to be used for men's full-fashioned hose which are made on long section footing machines.

Town House Hosiery Mills, Chilhowie, Va., and Royal Oak Hosiery Mills, Marion, Va., have been organized, with T. J. Wallner, of Virginia Maid Hosiery Mills, Pulaski, as president.

Pannill Knitting Co., Martinsville, Va., is installing 40 Tompkins spring needle machines for manufacturing polo shirts, fleeced underwear, sweaters, etc.

Rodgers Hosiery Mills, Athens, Ga., have awarded contract for an air conditioning system in a new addition, to be installed by Carrier Engineering Corp.

Wadesboro Full-Fashioned Hosiery Mills, Inc., Wadesboro, N. C., have been organized by W. J. Armfield, III, W. B. Moore, and L. D. Rivers of Wadesboro.

The Amos & Smith Hosiery Co., Pilot Mountain, N. C., have erected a building in which will be installed 21 new 24-section 45-gauge full-fashioned machines.

Thompson Hosiery Mills, Graham, N. C., will install 35 machines acquired from the Carolina Knitting Mills, Burlington, N. C., which are being liquidated.

Chilhowee Mills, Athens, Tenn., recently acquired by Van Raalte Co., are now operating under the direction of H. A. Vestal, formerly president and general manager of Chilhowee.

Nocturne Hosiery Mills, Inc., Union, S. C., have been incorporated to take over the full-fashioned knitting department of the Excelsior Mills.

Tower Hosiery Mills, Burlington, N. C., have completed a new addition to the plant to house 10 new "Reading" full-fashioned machines.

Pilot Full-Fashioned Hosiery Mills, Valdese, N. C., have purchased a number of new single-unit full-fashioned machines from Alfred Hofmann, Inc.

Crewe Hosiery Mills, Crewe, Va., of which H. B. Johnson is president, will start operations with 6 full-fashioned machines.

Wyatt Knitting Mills, Sanford, N. C., have been organized by W. F. Wyatt, Aetna Walker Wyatt, and John A. Bailey, all of Burlington.

Acme Hosiery Dye Works, Pulaski, Va., a new industry headed by Thomas J. Wallner, has awarded contract for a building, 32x200 feet.

Yanceyville Hosiery Mills, Reidsville, N. C., have put their first full-fashioned machines in operation.

◆

The National Association of Hosiery Manufacturers in commenting on the new synthetic yarns which are expected to find a use in the maufacture of full-fashioned hosiery states that this transition will probably have to occur over a period of time and will not occur over night. It states that the industry will have ample time to adjust itself to any change in conditions and believes also the industry is open minded and ready to experiment with and use new yarns if proven satisfactory.

TRENDS and HIGHLIGHTS of the KNIT GOODS MARKETS

Hosiery Mills Active—Especially Full-Fashioned And Women's Seamless—Underwear Knitters Improving Position and Much Better Year Predicted—Prices Show No Important Changes—More Local Hosiery Plants Reduce Wages

Philadelphia, December 17, 1938

WITH DEPARTMENT STORES and other retailers doing a Christmas business at least up to that of this time last year, hosiery manufacturers are pressed to make the prompt deliveries wanted in view of the continued refusal of retailers to stock up. They continue hand-to-mouth buying with this likely to continue into 1939. In addition to the active spot hosiery business, manufacturers here report a demand for early 1939 shipments and in some instances Pennsylvania knitters have booked these by naming low prices, that come closer than in any time in the past to meeting southern competition, which is the result of the new lower wage pacts under the new union arrangement. Under this wage cuts are offset by promises of the mill to install latest type machinery. Underwear manufacturers could be busier but they are gradually improving their statistical position with indications that the two seasons of 1939 will be considerably better in all respects than the two of 1938. Outerwear manufacturers are also busy getting out late heavy goods and then go right on spring lines.

Full-Fashioned

Demand for full-fashioned is good and the mills busy although in normal years they begin to taper off operations the first week of December. This year there will be less of that than for sevral years past and knitters report that as they finish the holiday rush they will start right off on January delivery orders which they have in hand. Production of full-fashioned goods this year will set a new record because by the end of October shipments were larger than those for the same 1937 period. Prices showed little change but some Pennsylvania plants are reported to have shaded lists to get large 1939 orders even though raw silk has been firm. Lower wages are reported to have brought about this condition but it is not extensive. Retailers say that gift hosiery this year calls for higher priced lines than a year ago with 79 cents and up the usual popular level. Branded firms report having so many rush orders on file that there is a delay in making December shipments.

Men's Half-Hose

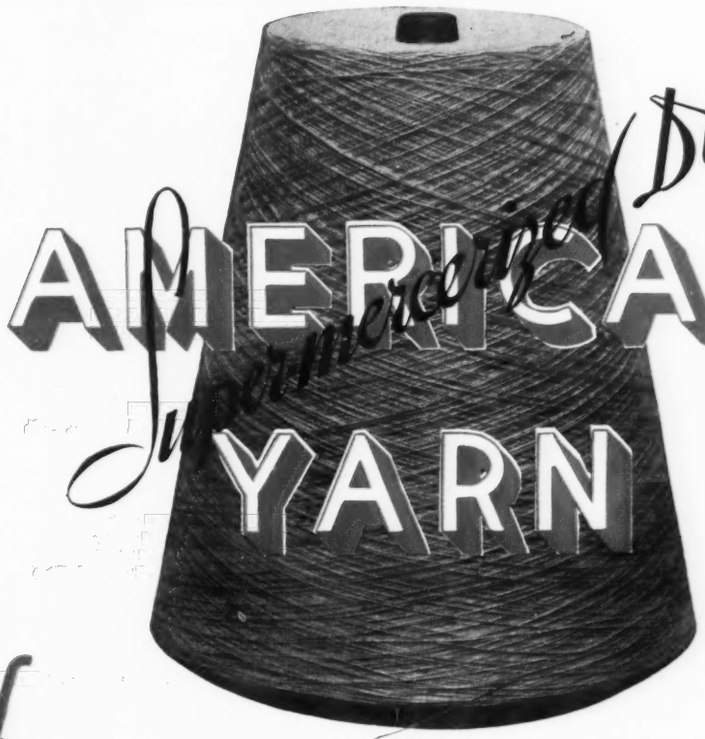
Half-hose have been bright spot with the mills and retail sales have also showed a nice expansion over recent weeks. Although October shipments were slightly under September it is felt that this comparison may be improved when figures for November and December are issued. Due to the severe hand-to-mouth buying policy of retailers there has been a delay in making deliveries of some lines of men's half-hose, this being the case in wrap goods. Cold weather has stimulated demand for wool hose that earlier this fall had been dull. These lines are moving well now all down the line with stocks that had accumulated are well cleaned up now. October shipments of half-hose while somewhat under the previous month were considerably larger than in the same 1937 month and the same trend is holding true now. In line with the tendency to give practical gifts this Christmas, men's half-hose are coming in for a large holiday buying.

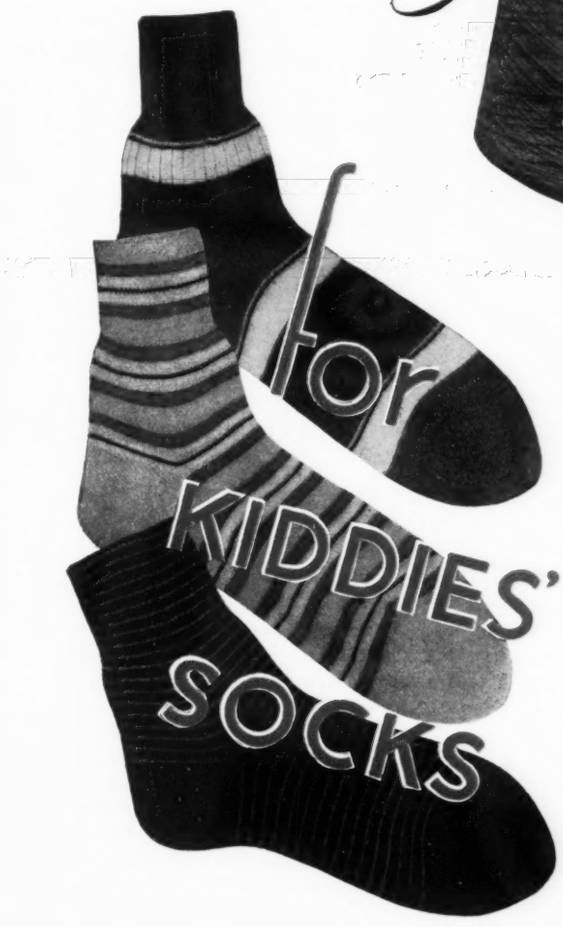
Seamless

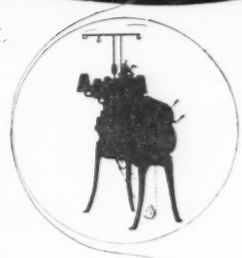
Along with full-fashioned, seamless hosiery has been making wide gains in production and in shipments. These two branches of the business showed gains in October shipments while others registered a decline compared with the previous month. Shipments in October were considerably higher than in the corresponding 1937 month with jobbers reporting that demand is keeping up very well this month also. Manufacturers are now booking less new orders as the time for inventory taking approaches but it is expected that they will be able to resume good runs early in the new year because most retailers are moving their goods as fast as they get deliveries and there will be a small amount of such goods held over this year. In the seamless branch cumulative shipments for 1938 were 13 per cent below 1937 at the end of April but by the end of October they were only 3.3 per cent under for the first ten months.

Anklets

Hosiery jobbers are placing spring season orders in these lines with the mills but they state even though whole-







FEWER SECONDS

American Yarn is trouble-free. It delivers to the knitting machine smoothly without breaks to cause delays, seconds, higher manufacturing costs.

MEETS THE EYE

American Yarn does not dye streak. Its uniform quality is easily apparent to the practiced eye of the purchaser of your finished product.

STANDS THE GAFF

The wearer is King when it comes to repeat business. American has catered to this fact from cotton to cone—at every step of its controlled processing.

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Mr. Jas. R. Moore
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NEW YORK, N. Y.
Schoolfield-Sauer Co.
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PHILADELPHIA, PA.
Wm. S. Montgomery
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CHARLOTTE, N. C.
Cosby & Thomas
Johnston Building

sale business has been good this month they are not placing larger initial order than a year ago. This cautious buying policy has been helped by the fact several knitters have recently reduced prices, taking off about what was added to the price earlier in the fall due to the wages and hours law. This has caused some hesitation in forward commitments but jobbers look for a good season in these numbers. Anklet shipments for the first ten months this year were considerably larger than in the corresponding 1937 period.

Underwear

There has been steady improvement statistically in the underwear field but this is not expected to be very beneficial to manufacturers until goods for fall of 1939 are shown after the first of the year. There has been a fair volume placed in spring weight goods but no rush. In the face of this there has been a substantial improvement in the stocks. These have been continually reduced so that by the year-end they will be in the best shape from the jobber angle for years. Orders for next spring have been larger than a year previous and this together with the low operations of knitters over most of the year resulted in a diminishing of stocks all down the line, giving the outlook, especially for the heavy goods season of next year, the brightest aspect in years. Curtailment among underwear knitters during most of 1938 meant they will not show large profits for this year.

"Ringless" Litigation Terminated by High Court

The United States Supreme Court late in November brought to a close the most bitterly fought patent litigation the hosiery industry has ever seen when it refused to review invalidation of the Kaufman multiple carrier "ringless" full-fashioned hosiery patent. The high court refused a writ applied by Julius Kayser & Co., New York, and the Textile Patents Corporation, Philadelphia, plaintiffs in the original action against the Rosedale Knitting Co., of Reading, Pa., for alleged infringement of the Kaufman patent. This refusal which had been generally predicted in legal circles, upheld the decision Federal Judge Oliver B. Dickinson in Philadelphia which was sustained in the Circuit Court of Appeals also in Philadelphia, that the patent was invalid for want of invention. A similar decision with regard to the Kaufman "ringless" patent issued in Canada was reached by the Exchequer Court of Canada.

The multiple-carrier patent was issued to Charles A. Kaufman of Julius Kayser & Co., on August 7, 1934, and the infringement suit was brought by Kayser on February 20, 1935, in conjunction with its licensing agent the Textile Patents Corporation, against the Rosedale company. Judge Dickinson's ruling was handed down April 13, 1937, and that of Circuit Court in July, 1938. Over 100 full-fashioned hosiery mills took out licenses to operate under the patent, while a group of about 75 manufacturers banded together to test the patents possible validity in the courts. It is estimated the expenses of both sides have exceeded $250,000. Under the licensing agreement manufacturers were called upon to pay royalties of five cents a dozen pairs until the time the patent should finally be held invalid in the courts. A counter suit was later filed by Rosedale in which triple damages were asked under the anti-trust laws.

The latter suit was heard by Judge Dickinson shortly after the infringement suit was tried but no decision has been rendered in the damage suit and opinion now is that the latter probably will not be pressed. The lower courts generally held that Kaufman's attachment lacked invention and also criticized the proceedings in which a number of other inventors conceded priority to him and later created the "Patent Pool" which Rosedale assailed as a violation of the Federal anti-trust law. The lower courts said in effect that the alleged invention was no more than the natural advance of the art involved.

FORECAST

(Opinion submitted by COTTON'S market correspondent)

Philadelphia, December 16, 1938

Retail sales of textiles are showing steady improvement and expectations are that the Christmas trade will be up to that of the previous year and larger this year in certain lines, including hosiery. As retailers have continued hand-to-mouth buying they are finding themselves in possession of smaller stocks and indications are the year-end will see many of their lines well cleaned up so that replenishment will be the rule early in the new year but this does not mean they are going to change their policy and stock up heavily. There will be, rather, frequent re-ordering of textiles giving manufacturers a steady business.

Nothing has occurred this month which changes our previous prediction that textiles will experience a good period during the first half of 1939; in fact, developments have confirmed that this is in prospect. Not only will volume be satisfactory, with no boom in sight, but also that profits will be better than in the same period a year previous. Commodity prices are not jumping as they did during early 1937 when the danger signs were really out for wise manufacturers but rather these are holding mainly unchanged in textiles except for some slight easing in cotton.

Cotton prices have discounted the large crop and no great price change in that commodity is near but indications are that on the next buying wave in yarns and goods, cotton manufacturers will have a chance to widen somewhat their profit margins which are still small.

Wool top futures have been easy, declining almost 5 cents in little more than a month but wool dealers have not reduced prices on spot wools and cannot understand why futures should go off. It is possible the threat of lower tariffs on wool in new trade pacts may be involved. In view of this buyers of wool yarns are not placing much new business but taking large deliveries on old contracts instead and this seems to be the best present policy until this tariff situation clarifies itself.

Silk has been steady and the statistical picture strong so that with large American consumption the price trend in this commodity is apt to gradually upward so that by the end of the first 1939 quarter the market should be higher than now. This means hosiery manufacturers should be covered a fair extent ahead at present and buying of this nature has been apparent recently in addition to buying to cover active mill operations on current orders. Hosiery prices are not apt to change much when spring prices are named around the first of the year.

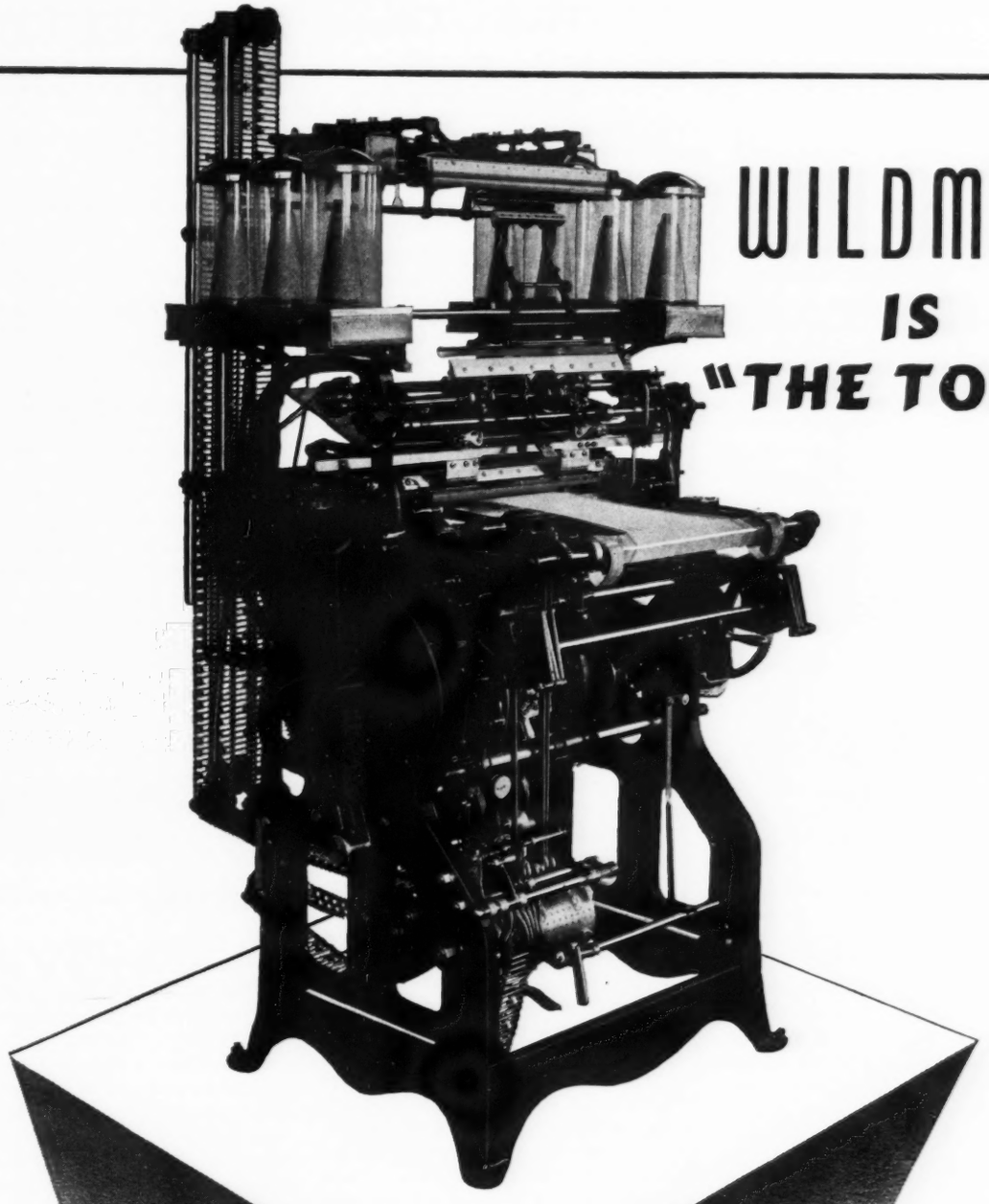
Rayon is gradually improving its position with larger sales but there is nothing in the market to point to any immediate price change. The weaving end has been slow and until that improves knitters need not worry about higher prices although the trend will be up when any changes are made.

In view of the outlook for good demand in textiles over the coming months purchasers can well cover somewhat further ahead than they have during previous months and assume a more liberal but not excessive policy of buying. No one can see any run-away price markets. A falling off in activity late this year and possibly in January would only mean a "breathing spell".

British-American Pact Changes Rates on Knit Goods

Lower tariff duties on a variety of knit goods products, including American silk hosiery and English wool hosiery, as well as on knitting machinery, will go in effect January 1, 1939, as a result of the reciprocal trade agreement recently signed by the United States and Great Britain. This treaty is expected to result in a greater flow of hosiery between the two countries and is to remain in effect for a three year period or indefinitely thereafter unless terminated on six months notice. Great Britain changed the duty on American socks and stockings containing silk from 43⅓ per cent of the valuation or 12 shillings per pound, whichever was the greater, to 43⅓ per cent of the valuation or 12 shillings per pound provided that in no case the duty exceeds 10 shillings per dozen pairs.

Shippers of full-fashioned goods to Great Britain say that during recent months the value of their hosiery exported averaged about $7 per dozen on which the duty was a little over $3. Under the new agreement the duty will



WILDMAN IS "THE TOPS"

The WILDMAN Single Head-Single Unit machine represents the outstanding mechanical contribution to the manufacture of full-fashioned hosiery of modern times. It knits the complete stocking in ONE operation, on the one head with that perfect matching of leg and foot so important to volume production of today's sheer grades. Yes! this WILDMAN machine is "TOPS" because it produces stocking perfection from top to toe. Write for details of the many advantages and economies of this machine.

WILDMAN MANUFACTURING COMPANY, NORRISTOWN, PA.

WILDMAN SINGLE-HEAD, SINGLE UNIT FULL-FASHIONED HOSIERY MACHINE

apparently be $2.50. On English wool hosiery valued at $1.75 to $3 per dozen the United States lowered the tariff duty from 50 cents per pound plus 50 per cent of the valuation to 50 cents per pound plus 35 per cent of the valuation, a reduction on wool hose valued at $2 per dozen, for example, of 30 cents per dozen. On wool hose valued at more than $3, the reduction is from 50 cents per pound plus 50 per cent to 50 cents per pound plus 25 per cent, a reduction on hose valued at $4 per dozen of $1 per dozen. The United States also lowered the duty on imports of English circular knitting machines from 40 per cent of the valuation to 20 per cent while the tariff on other textile machinery presumed to include other knitting machinery was dropped from 40 per cent to 25 per cent. England made no concession on circular knitting machines imported from the United States the duty on these remaining at 20 per cent of the valuation. Other concessions made to Great Britain by the United States were on cotton underwear, gloves and mittens of wool, wool knit underwear.

Canadian Trade Agreement Studied by Manufacturers

The new trade agreement with Canada holds out slight hope to domestic hosiery manufacturers regaining the trade with that country which was so important ten years ago. Canadian rates on wool hosiery from this country stand unchanged at 32½ per cent plus $1.35 a dozen. New rates on hosiery other than wool are 20 per cent plus $1 a dozen pairs compared with the old rates of 32½ per cent plus $1.35 a dozen which appears on the face of it to be quite a drop. In 1929 American hosiery manufacturers did a total business with Canada of $1,845,000. The Canadian duties then were 30 per cent or 35 per cent only. In 1930 the duty was increased to 35 per cent and $1.50 per dozen and by 1935 imports had dropped to $7,000. The slight reduction in 1936 in the most favored nation provision had little effect. The imports last year by Canada from this country were only $9,575. The Government has estimated that one of the effects of the new treaty will be a benefit to American producers, especially those making higher priced hosiery but the knitting industry is well aware that for several years important American manufacturers of full-fashioned hosiery have had separate plants in Canada. The situation in that end of the business would seem to be unchanged under the new agreement.

Spring Hosiery Colors Stress Light Shades

Ten new hosiery colors have been shown in the advance edition of the 1939 spring hosiery card issued to its members by the Textile Color Card Association. The new hosiery shades are in general lighter than those of last spring. There were some who felt several months ago that the trend during the present fall and winter would be towards darker shades but even during this period retailers reported that the call for the neutral shades was good while that for darker shades was poor. The new colors are named and described by the association as follows: The bieges: Rosehaze, a blush tone which is smartly worn with shoes in the spring wine gamme as red burgundy and claret as well as with Parisian Blue, Marine Blue, Brown Mahogany and black. Animation, a glowing Biege which will be important for spring with such costume shades as greenish blues, aqua, peacock and light duck gamme. Charmant, a light biege which will go well with many new costume colors including the entire family of blues. Brisk, a neutral biege, recommended as a favored shade with costumes in navy and medium blues, neutral bieges and browns, greens, garnet and other spring reds.

In the sun tones there are, Sunglory, a suntone which will go well with sports clothes in whites and pastels. Burnt Tan, a golden tan which is a burnished shade in harmony with costumes in animated yellowish greens, greenish blues, black and brilliant sports colors. Golden Dawn, a suntan which because of its sunny cast, this tropical tone is widely stressed for cruise and summer wear with pastels, vibrant hues, and white. Other shades include Apres-Midi, a rosy biege which is complement to the new red and rose shades of bluish or mauvish cast. Titian Glow, a sunburnt shades for wear with costumes in blues, browns and warm tans and greens as well as rust or copper hues. Pagan, a terra-cotta hue which complements harmonizing terra-cotta and rust tones in costumes.

Aberle Moves Machinery Without Dismantling

Charles Van Horn of Aberle, Inc., in co-operation with the Keystone Construction Co., of Trenton, N. J., has developed a money saving method to move full-fashioned hosiery machines from one plant to another without dismantling the machines to be moved and without interfering with production on the machines in the Aberle plant which are not to be moved. The full-fashioned machines being moved are 24 in number and are 45-gauge and are being moved to another location more than a hundred miles from Philadelphia. The machines which weigh approximately seven tons are placed in a long steel apparatus which holds it suspended and in which it is moved as a unit to a window in the plant outside of which a steel arm has been constructed. On this steel arm the machine is lowered a considerable distance to the ground where it is loaded directly on a specially constructed truck for delivery to its new destination. The special apparatus both inside the plant and out for accomplishing this feat was developed after a long period of experimentation by Mr. Van Horn of the Aberle company in co-operation with a Mr. Barber of the Keystone Construction Company. Because of the great saving this means in both time and labor in moving full-fashioned hosiery machinery as compared with the former method of dismantling it, great interest has been displayed by other manufacturers as well as builders of machinery.

Tilles Lauds Union Agreement in an Address

Roy E. Tilles, president of the Gotham Silk Hosiery Co. in an address before students at Vassar College said that the American Federation of Hosiery Workers "has fully under written our American profit economy in the type of agreements it is currently negotiating with employers in the hosiery industry." Mr. Tilles also said that his company is now entering a large scale expansion program by installing the latest equipment in accordance with one of the important features of the union agreement. "This agreement", he said referring to that into which the unionized branch of the industry entered earlier this year, "is the frankest recognition of the profit economy of American industry ever accorded in American labor relations. I state this frankly and boldly, since the union itself recognizes that American industry can only exist with profits.

"Under our present agreement, both parties are bound so as to permit job security and continuous tenure of employment, provide a fair and equitable method for the adjustment of all disputes and grievances, strive for the general stabilization of an industry which, with its auxiliary industries employs 50,000 persons. Neither party will exercise its rights, powers or func-

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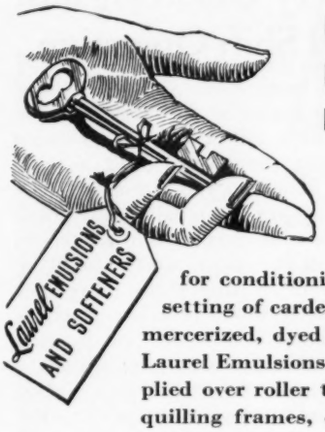

USE THIS KEY TO PROPER REGAIN AND EVEN RUNNING YARNS

Developed out of our 15 years' experience with spinners, converters, and knitters . . . for conditioning, softening and twist-setting of carded and combed grey yarns, mercerized, dyed and bleached yarns . . . Laurel Emulsions and Softeners, when applied over roller troughs on cone winders, quilling frames, or twisters, will produce even running yarns.

Let us suggest the right Laurel Emulsion or Softener for your purpose . . . and the best method of application. Shall we have our representative call?

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IN ALL NUMBERS FROM 3's TO 40's.
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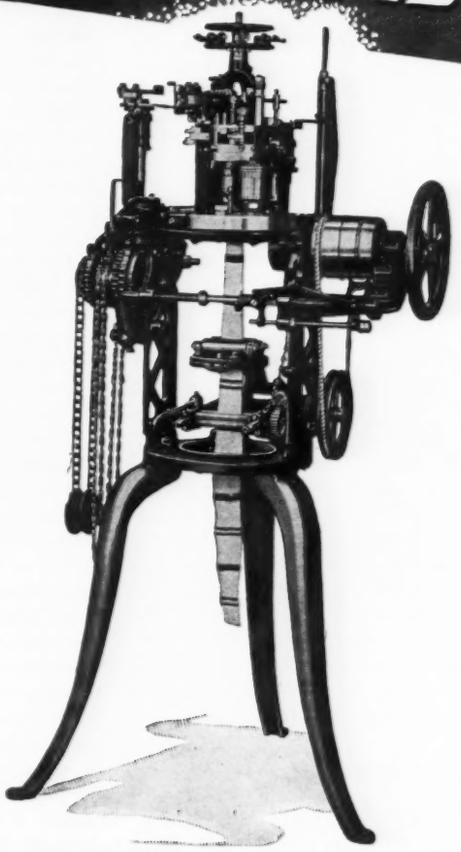

Rubber Lay-In
Picot Edge
3 & 4 Color Yarn Changes
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Let the new, modern Brinton Ribbers carry the burden of your production problems. Modernize your old ribbers, by converting to the latest styles. . . . For dependable, economical production—rely on Brintons.

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BRINTON CIRCULAR KNITTING MACHINES

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Philadelphia, Pa.

tions oppressively in dealing with the other. Both parties agree to work cooperatively to obtain the highest possible efficiency of operation in all mill departments. For the first time in the history of the industry the contract period exceeds one year and is set at three years under the present pact, thus insuring three years of stable operation. The contract fully recognizes difference in the ability of plant managements as to their efficiency of method, encourages experimentation and the improvement of present methods, and provides for a mutual sharing of all benefits so derived between the employer and his employes. The agreement specifically recognizes the present pace of technological and mechanical change, and virtually obligates the employer to keep pace with the advance of mechanical ideas."

"Man Bites Dog" Hosiery Mill Item

Reversing the migration trend of recent years the Collegiate Hosiery Co. is starting operations in Philadelphia with 89 seamless knitting machines moved from the Mountcastle Knitting Co. of Lexington, N. C. This is an unusual news item because all such in the past have been for machinery removals or plant removals from that city to the South. The new company has been started by Harry Belber formerly with the Sportwear Hosiery Co. and floor space has already been leased at Amber and Willard Streets. The machinery is mainly Banner and Standard machines which will produce men's novelty stocks, boys' slacks, golf hose and crew socks.

Urge Hosiery Men to Attend Conference

Hosiery executives are being advised by the officers of their national association to make their plans to be in New York in January for the annual hosiery industry conference. The organization is pointing out that "there has been no time in recent years with the probable exception of the code period when this industry and other industries have been faced with so many problems of import which can be dealt with only through industry-wide co-operation and planning". Recent developments are enumerated in support of this statement. There is, for example, the new wage and hour law, the work to date of the Temporary National Economic Committee, the group conducting the monopoly investigation; and the Federal Trade Commission rulings on fiber content labeling, particularly the more recent ones covering silk and wool. All of these concern movements on the part of the Government effecting manufacturers and merchandisers. Only through organizations like that in hosiery are manufacturers and distributors enabled to protect their interests to the best advantage.

Additional Progress Made In Union Agreements

During the past month several new agreements have been reached by the American Federation of Hosiery Workers and manufacturers in line with the new policy adopted earlier this year of having individual contracts rather than one general agreement. Late in November the D. S. & W. Hosiery Co. signed an agreement covering about 500 employes in this Reading plant. On December 8 the hosiery union branch at Reading announced that it had completed contracts with five Berks county mills that are among the thirteen represented in the Keystone Hosiery Manufacturers, Inc. It named the following mills in this connection: Nolde & Horst Co.; Busy Bee Hosiery Co. and Industrial Knitting Mills of Reading; the Birdsboro Knitting Mills of Birdsboro and the Burkey Underwear Co. at Hamburg, Pa. The union reported that the contracts are for three years and provide for wage revisions, hiring of union workers, the check-off, rehabilitation of machinery and closed shops when 70 per cent of the productive workers in any plant become members of the union. According to the union spokesman John C. Evans of Albright College is named arbitrator. From sources close to the conferences at which negotiations were conducted during the last five months it was reported that the new contracts provide for a 15 per cent wage reduction. Meanwhile counsel for the Keystone group declared that the union statement was premature. A few days previous to this employes of the Phoenix Hosiery Co. voted to take a cut of 11½ per cent in a contract with the Milwaukee branch of the union.

Hosiery Local Re-Elects Leader

William M. Leader has been re-elected president of the American Federation of Full Fashioned Hosiery Workers, Branch No. 1, of Philadelphia, by a majority of about 700 votes, nearly a 2 to 1 victory over his opponent, Joseph P. Burge. That was announced by Roland Brown, chairman of elections after a count of votes taken in Knitters' Hall. Others elected were Joseph Kline, first vice-president; Howard Kirsch, second vice-president; Harry Ohmig, secretary-treasurer, and Hugh Brown, recording secretary.

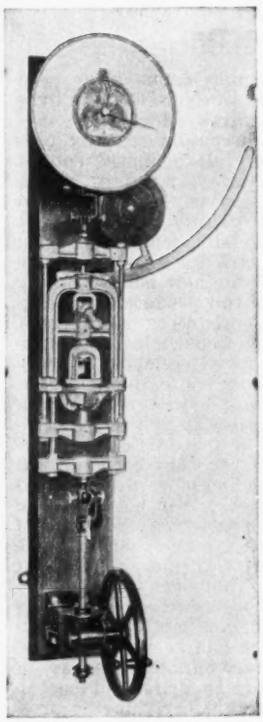
Hosiery Union Against Third Shift Operation

It has been reported the national executive board of the hosiery union decided at a recent meeting it would not permit the operation of a third shift in unionized full-fashioned mills. The union has prepared figures similar to those developed elsewhere showing that if the entire full-fashioned industry went on three shifts its productive capacity would be much in excess of consumptive demand. On a two-shift basis the present equipment of the full-fashioned industry can produce more than enough merchandise to satisfy the domestic and export demand. While many believe the reports of its adoption by some mills have been exaggerated others feel the trend in that direction is strong. Two-shift operation was a rarity not so many years ago. Today it is standard procedure. Those who do not want to see three shifts become standard are giving serious thought to practical means of accomplishing this end.

Homestead Hosiery Mills To Employ 670 Workers

A communication received from the Farm Security Administration by the Hosiery Examiner, of Reading indicated that the Government subsidized hosiery mills will employ 670 workers, as follows, Red House, 169 workers, Cumberland, 167, Penderlea, 170, Bankhead, 58, and Skyline, 160. In commenting on the matter the communication stated each management contract will provide that all operations shall be conducted in accordance with the labor relations provision to be prescribed from time to time by the Secretary of Agriculture including but without limitation to, provisions for maximum hours of labor, minimum rates of pay, free collective bargaining, special conditions governing employment of female labor, safety regulations and prohibition of child labor provided that the operator shall be given reasonable notice of a change of any labor relations provision by the Secretary of Agriculture and a statement of the reason therefor. Since operations are not expected to commence at these projects before the middle of the winter or early next spring, no notice of labor standards as yet has been issued by the Secretary of Agriculture.

SCOTT TESTERS



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If you are forced to raise prices you can do much to combat price resistance by making your packaging more attractive and to more properly convey the idea of quality. A well known line of hosiery forestalled customer objection to higher prices by materially beautifying their packaging.

So if you must raise prices or if you feel that your package itself should produce more sales, we can show you how you may make your packaging more attractive without necessarily adding much to the cost.

In fact, through our "CO-ORDINATED PACKAGING," whereby we *match* your various packages, we can often save you considerable money through economies in artwork, plates and printing. *Designs for boxes and displays submitted without cost or obligation.*

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TRENDS—THE YARN MARKETS

Wide Interest In New Synthetic Yarns—Large Deliveries Continue But New Business Is Tapering Off—Prices Show No Wide Movement But Cotton Yarns Ease—Mercerized Shipments Large

Philadelphia, December 16, 1938

THERE has been a spotty price situation in the various yarns this month with no general trend. Cotton yarns are a shade easier due to year-end tapering off in buying and lower cotton; silk has been steady with not much change while rayon and worsted yarns show no great change but in worsted, medium grades have been stronger than those yarns made from fine wools. The British trade treaty to become effective January 1, 1939, is worrying worsted and cotton yarn spinners but not too greatly. Fine counts of combed cotton are mainly hit while worsted yarns to go into staples may be imported with the lower duties in the new pact but for the present most manufacturers are busy using old yarn orders and are not going to worry over the trade agreements until they see how it works out during the coming year.

Cotton Yarns

Cotton yarns have been soft over the past month in sympathy with the raw cotton market, reductions in each being approximately one-half cent. Yarn prices have also been soft because spinners have been shipping out at a much more active rate than they have been booking new business but they remain in a good statistical position, having several weeks business on their books and in the case of combed some of the larger producers report having as four months business ahead. The latter applies to spinners of single combed who have been enjoying the most active run for a long period. Deliveries on old contracts have been exceptionally good and consumers have been content in the majority of instances to accept deliveries on their old orders and place relatively little new business. There is little fear of higher prices among the consumers even though there is considerable discussion as to the possibility of spinners being compelled to pay a higher minimum rate of wages in the near future under the wages and hours law.

Mercerizers have also been enjoying an active spurt with deliveries during recent weeks being as large as any similar time this year and practically all of these processors are operating at full time rates. They have in addition several months forward business on their books and in some instances their customers are covered fairly well ahead until the middle of 1939. These old contracts were placed late in October when the last buying wave occurred in mercerized yarns. These counts are unchanged in price but are firmer at the 63 cent level for 60s two-ply than any time previously this year, the previous buying wave having been on a price basis several cents under this level at which time knitters claimed to have bought around 60 cents.

Under the British-American reciprocal trade agreement duties on cotton yarns were lowered but the most drastic cuts were made on finer counts which are expected to affect particularly spinners of combed yarns 60s and finer. This is the section of the yarn market which has been particularly dull over the past year so that spinners are concerned over the possible effects that will develop beginning January 1, 1939, when the new trade pact goes into effect. One effect of this already has been that several spinners of fine combed yarns have announced that they are about to change their equipment to enable them to manufacture medium and course counts instead in which they expect less active competition from the English spun imports.

Silk

There has been little change in the price level of raw silk over the past month and interest from the hosiery trade has been considerably more active in sympathy with the active operating schedules of full-fashioned and also knitters of women's seamless hosiery. In addition to a better demand from the hosiery trade there has also been an improvement in the takings of the weaving trade. Even though normally full-fashioned hosiery manufacturers begin to taper off their operations around December 10 there was no trend of importance along these lines this month, manufacturers in this district reporting that they would continue active right up to the time for taking inventory and after that many of them state that they are in possession of a fair amount of business for delivery early in the new year.

The consumption of raw silk in November by American manufacturers was surprisingly large and was several thousand bales higher than trade estimates had previously predicted. November raw silk takings totaled 41,599 bales which originated as follows: 39,375 bales from Japan, 1,302 bales from Shanghai, 41 from Canton and 880 from Europe. November takings set a record for 1938 and were the largest in twenty-two months or since January 1937. Previously most predictions had been that consumption would be between 36,000 and 30,000 bales. Imports for the month were 44,006 bales the bulk of which came from Japan and with less than 2000 bales from Shanghai and 746 bales from Europe. Trade opinion is that the outlook for silk is for continued steadiness with the possibility of a tighter situation developing by the end of the first quarter of 1939.

Rayon Yarns

No new announcements have been made this month in connection with the new synthetic yarns which have created so much discussion recently particularly in the full-fashioned end of the knitting business where it is expected this new type yarn will find a large market. Trade opinion is that little danger to silk will come from this new type yarn for at least twelve months or until the new plants making this yarn are in full production. Larger rayon yarn producers report that orders have been booked in an encouraging volume for December delivery and they feel optimistic that this expansion in demand will result in a fairly sharp upturn in orders for January. One of the features of the market in this type yarn has been the call for the finer deniers for use in plied yarn cloths which are in good demand but notwithstanding this the bulk of current demand centers around the standard bright 150 denier, 40 filament viscose weaving number.

Another feature of the market has been the broadening activity in knitting yarns which had been lagging previously. It was felt that stocks of these yarns were in danger of becoming cumbersome but early in the present month knitting demand expanded to a better volume than for many months and should activity continue at the present rate year-end stocks will probably be below normal. Prices of rayon yarns have not changed and shipments for the first eleven months are approximately equal to the same 1937 period.

Worsted Yarns

Signing of the British-American trade treaty has created much interest in the worsted yarn market both in respect to the threat of much larger imports of both yarn and goods later on in 1939 after importers have made arrangements to carry stocks in this country and make detailed studies of American specifications. Majority opinion is that imports will be largely confined to the standard type yarns because it is regarded as impractical for English spinners to compete to any great extent in the novelty yarns or in counts such as men's wear mixtures. Spinners of standard knitting counts feel that there is a real danger that by the middle of the new year competition in such yarns as 2-20s, 50s, may become a real threat, reports being at present that the English landed price is slightly under the domestic level.

Although wool top futures have declined approximately five cents in the last month, attributed to the possible effects of trade agreements there has been no change in the spot wool price level and worsted yarn prices have remained generally unchanged but not quite as firm as a month ago. Outerwear manufacturers have been fairly busy this month although normally it should be between seasons. Manufacturers have been busy both on late winter orders and spring goods.

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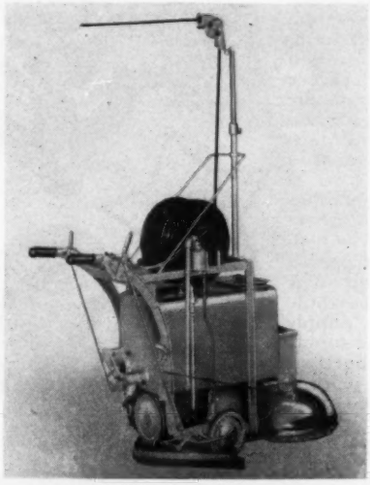
Our experienced floor maintenance engineers will help you eliminate wasteful expense on floor conditioning and show you how your floors can be kept cleaner and safer with minimum interruption to production through the use of the Lawlor Scrubbing Machine and Selig materials and methods.



Illustrated at the left is the new Model 20-C combination scrubber and water vacuum pick-up. It is a one-man machine which is easily operated and has a greatly increased scrubbing capacity.

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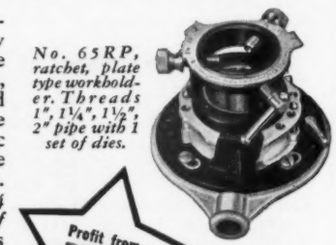

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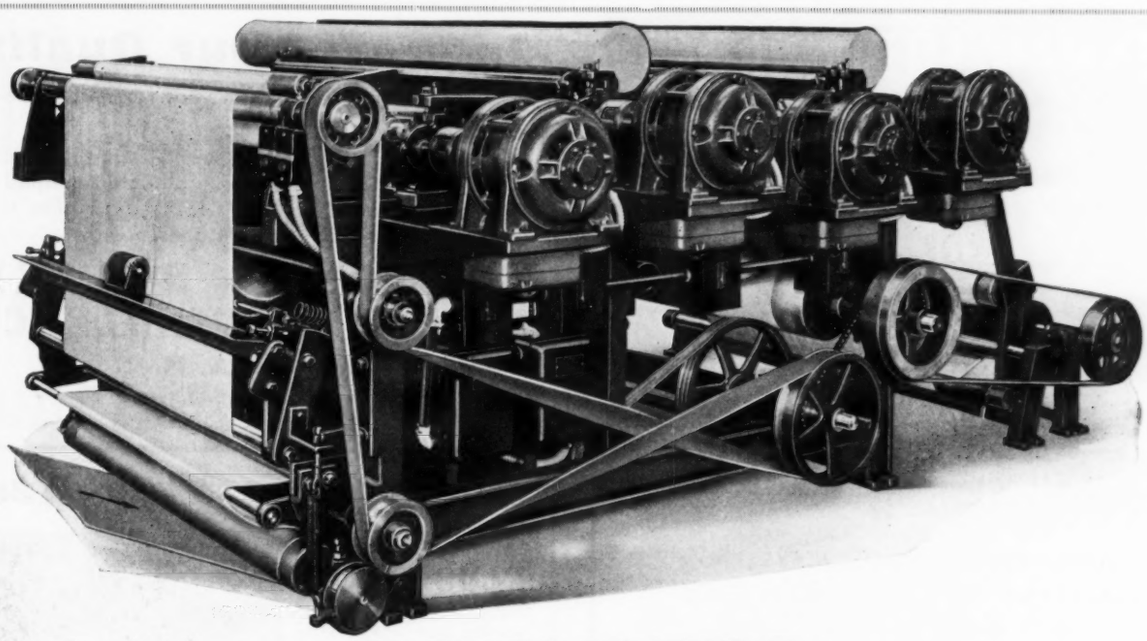

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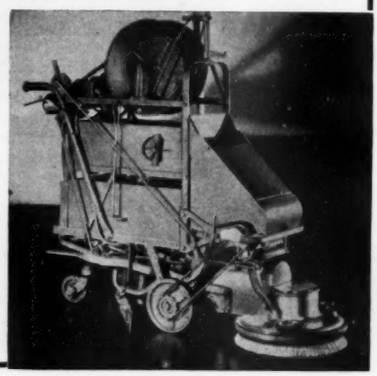

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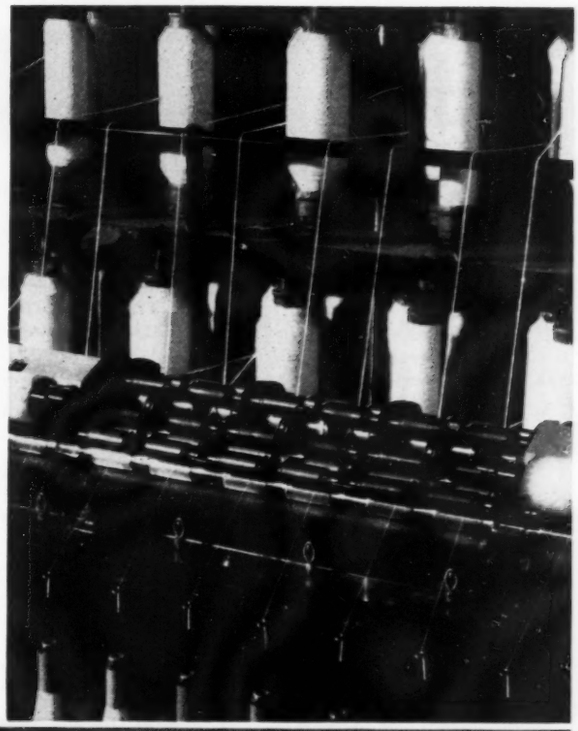

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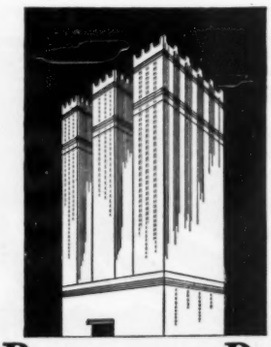

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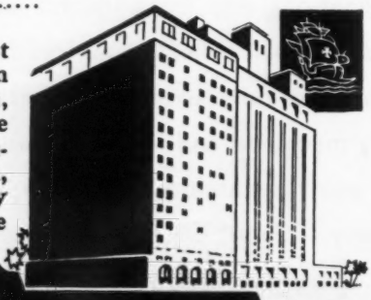

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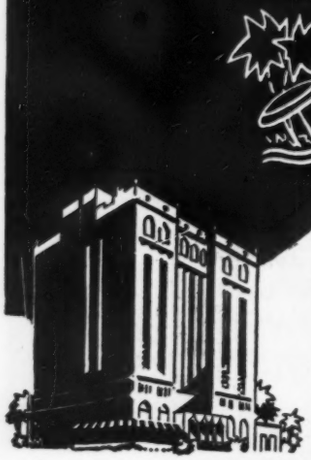

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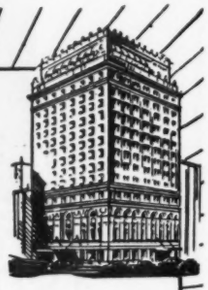

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All Woonsocket Roving Frames have Campbell B. B. top rolls and most have chain drive horsehead.

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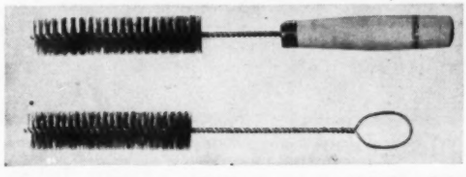

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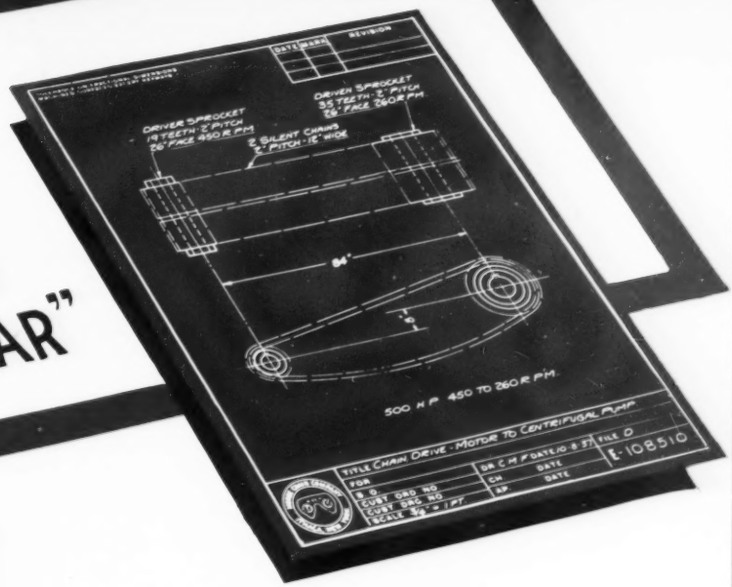
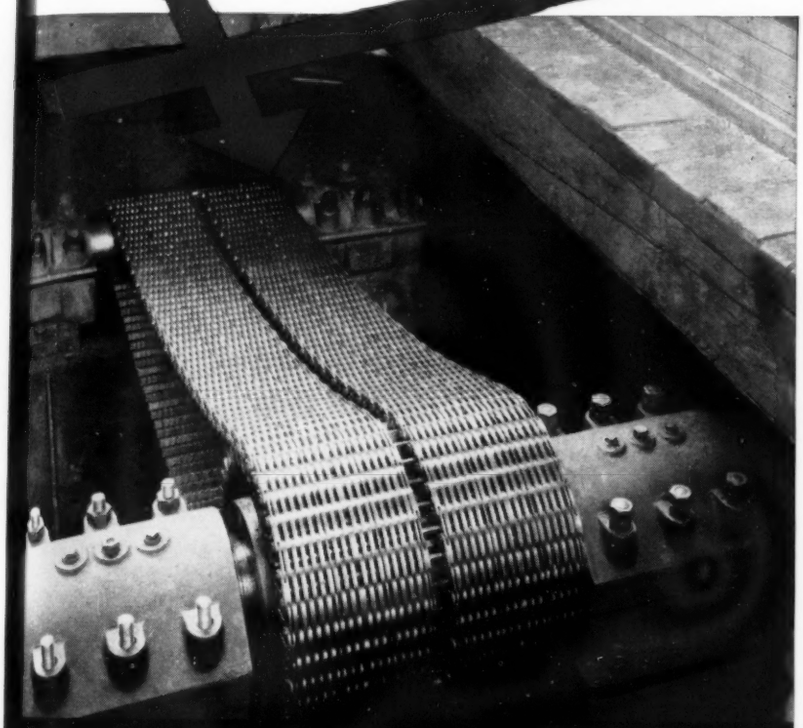
THIS MORSE SILENT CHAIN, 23 YEARS OLD, is "now beginning to show a LITTLE WEAR"





Above is the Morse Silent Chain installation which has driven a pump for almost a quarter century.

HERE IS THE BASIC PRINCIPLE OF MORSE DRIVES:
THIS WHEEL IS EASIER TO TURN—
100
THAN THIS—
100
—OR THIS
It is difficult to get a good grip on a smooth faced wheel.
It is even difficult to get a good grip on a grooved wheel. But—it is easy to grip and turn a toothed sprocket. Teeth, not tension, do the trick.
The teeth in Morse Chains, too, grip and hold and cannot slip.

Economical, Efficient, Power Transmission with MORSE TROUBLE FREE SILENT CHAINS

Away back in 1915—twenty-three years ago—a Morse Silent Chain driven pump was installed for an upstate New York plant. Just the other day a letter came from the pump manufacturer asking for quotations on repinning the drive. It seems that the chain is "now beginning to show a little wear."

Well, even a Morse Silent Chain can't last forever!

Morse Silent Chains have always been great performers, constantly improved year after year and delivering power smoothly, surely, with efficiencies up to 99.4%. The multiple teeth of the chain acting upon the sprockets reduce wear to an absolute minimum, lubrication is no task at all, and service and maintenance stops are few and far between.

In hard driving jobs and easy ones, Morse drives turn the wheels without slipping or faltering. Production levels rise to new highs, power costs are shaved because of greater drive efficiency, maintenance costs are lowered through the sturdy, trouble-free construction of these better drives.

There's a Morse Silent Chain for practically every power transmission job. Pitches from ⅛" to 3", capacities from fractional to thousands of horsepower.

Ask the Morse man in your territory about Morse Silent Chains. Or write Morse, Ithaca, New York.

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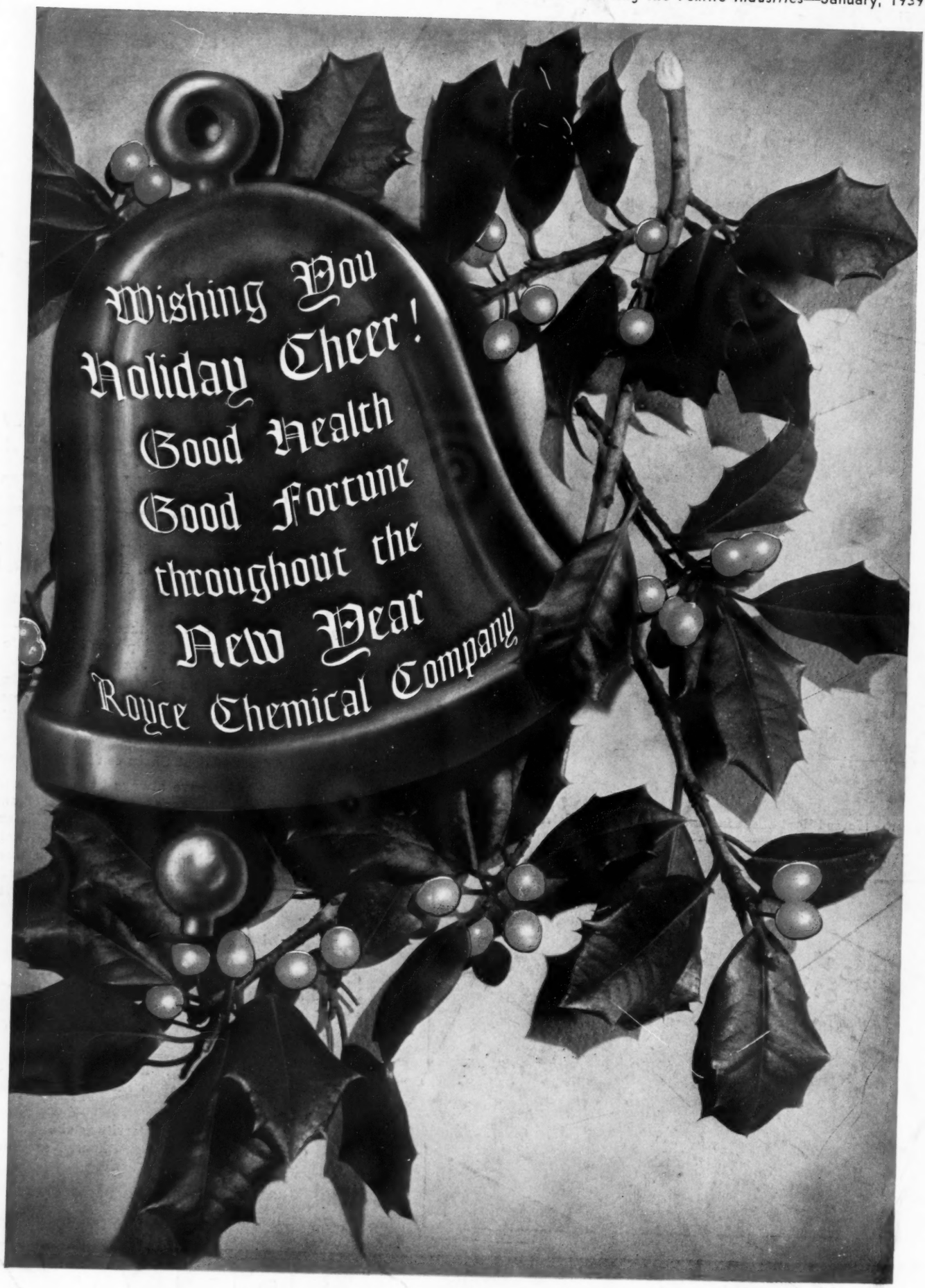
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